SPAUN™

Product Catalogue

EDITION **20**

Highlights in 2018

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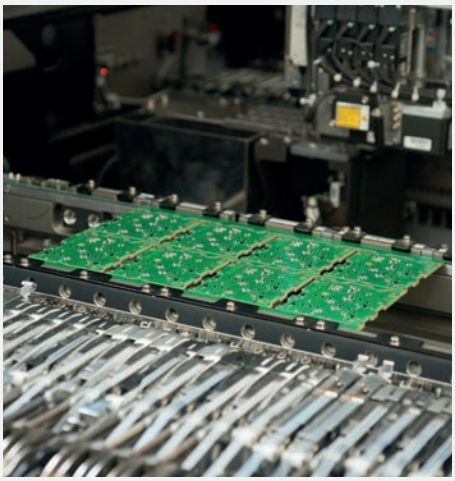

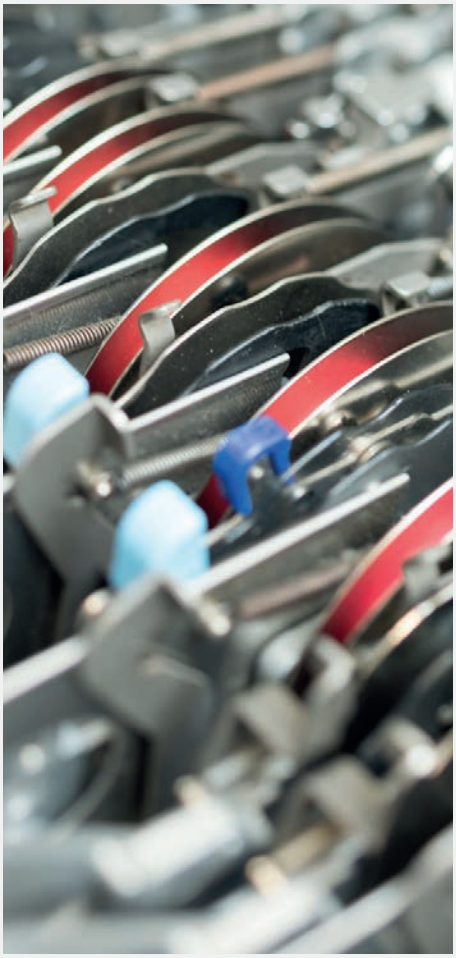

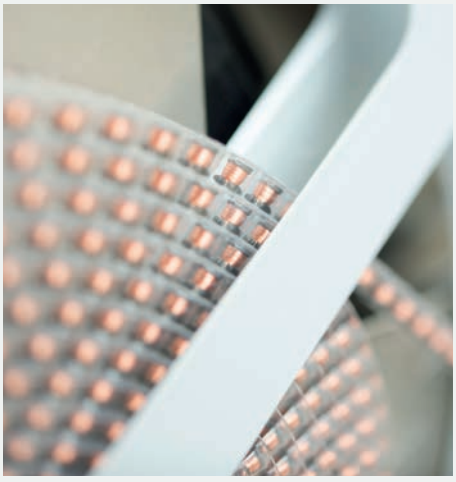

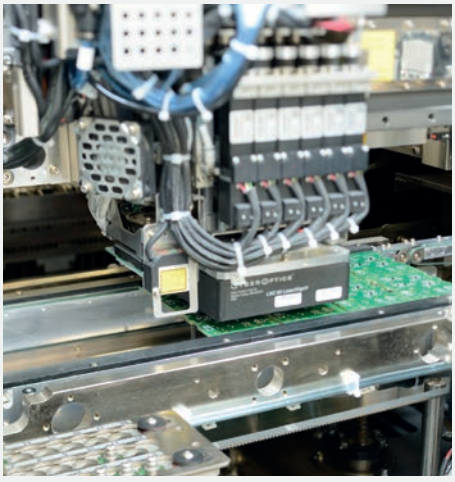

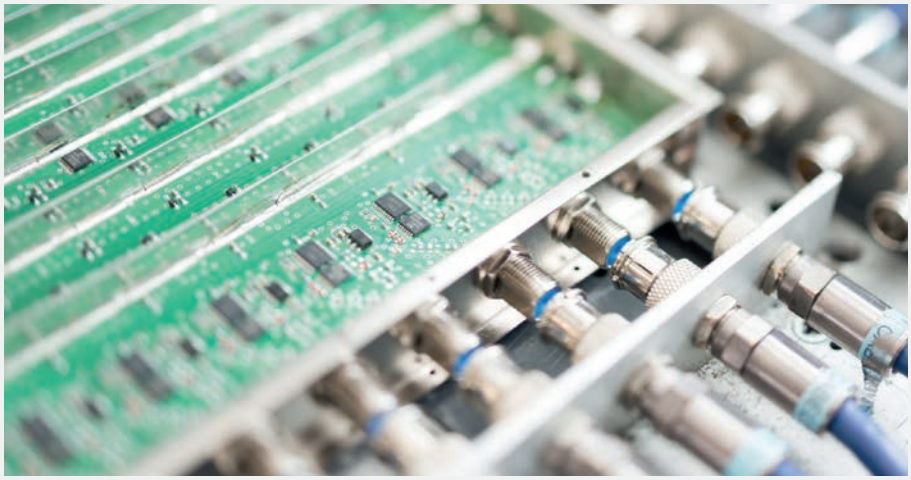

EU Directive

With CE labeling SPAUN confirms the conformity of the corresponding products with the applicable standards.

Declaration of Conformity

We hereby inform about our compliance in accordance with regulation (EC) No 1907/2006 (REACH), Article 33. SPAUN electronic is a manufacturer of products according to the above regulation and a „downstream user“ of small quantities and therefore not subject to registration.

SPAUN provides only non-chemical products. These include no substances according to REACH Article 7 which has the intention to release under normal or reasonably foreseeable conditions of use.

Information about the ingredients are based on the information provided by the suppliers of SPAUN electronic. Accordingly, based on our current knowledge there are no substances in our products of more than 0.1% by mass, which are called in the candidate list (SVHC) of the European Chemicals Agency (ECHA).

This list (available under http://echa.europa.eu) is monitored by SPAUN electronic.

Declaration of Conformity

For implementing the RoHS directive also all suppliers were involved. The corresponding compliance certifications are available.

Thus, we hereby confirm that all of SPAUN electronic GmbH & Co. KG manufactured products correspond to the EU Directive 2011/65/EU from 01/07/2011.

WEEE Directive

WEEE - Reg. - Nr. DE 18925686

By the European WEEE directive 2012/19/EU (Waste Electrical and Electronic Equipment directive) the recycling of waste in consumer electronics is controlled. The symbol indicates that a product according to the WEEE 2012/19/EU and national laws must be disposed of designated public collection points.

The required measures for WEEE have been inplemented and completed in 2005. Our WEEE registration number: WEEE - Reg. - No. DE 18925686.

SPAUN electronic is contractor of the Interseroh system „detecting, sorting and recycling of packaging“. The disposal of sales packaging takes place via a participation in the Interseroh dual system.

The Interseroh registration is confirmed with manufacturer number **80412**.

The new SOLAS system

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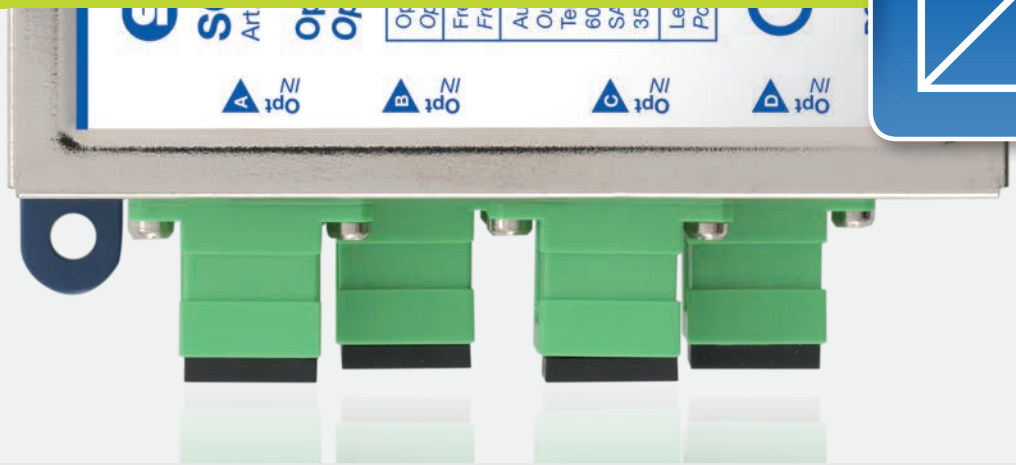
SOLAS SOTx

- The transmitter converts a CATV signal into an optical signal.
- Optical output power: +11 dBm.

SOLAS SORx

- Optical receiver for CATV signals in the frequency range of 47 ... 1006 MHz.
- The receiver does have an AGC control.

Optical Distribution



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Optical headend for the conversion of up to 16 SAT IF (DVB-S/S2) signals and 1 terrestrial (DVB-T) signal on a single fibre optics cable

L_BOX SOTx

The L_BOX SOTx offers the possibility to transmit up to 16 SAT IF signals + DTT (DVB-T) on a single fibre optics cable.

Features:

- 19“ housing for wall or rack mounting with redundant switched-mode power supply.
- For each SAT system (4 SAT IF input lines) one transmitter card is required (not in scope of delivery).
- LNB control with 12 / 18 V+22 kHz or 12 V.
- Configuration and monitoring via LAN/IP.
- The L_BOX SOTx has an optical SC/APC output.
- Distribution to up to 32 optical nodes is possible.

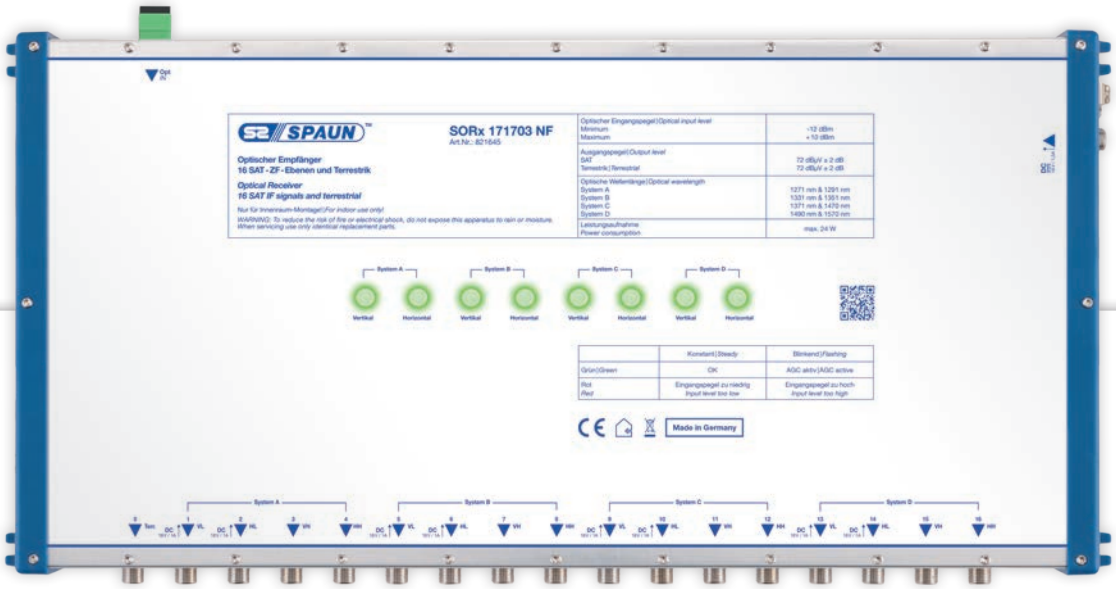
Model Art. No.	L_BOX SOTx 19" Base unit 821500
EAN	4040326215005
Mains power U~	200-240 V / 50 Hz
Redundant power supply	✓
Ambient temperature	-10...+50 °C
Dimensions (mm)	486 x 356 x 150

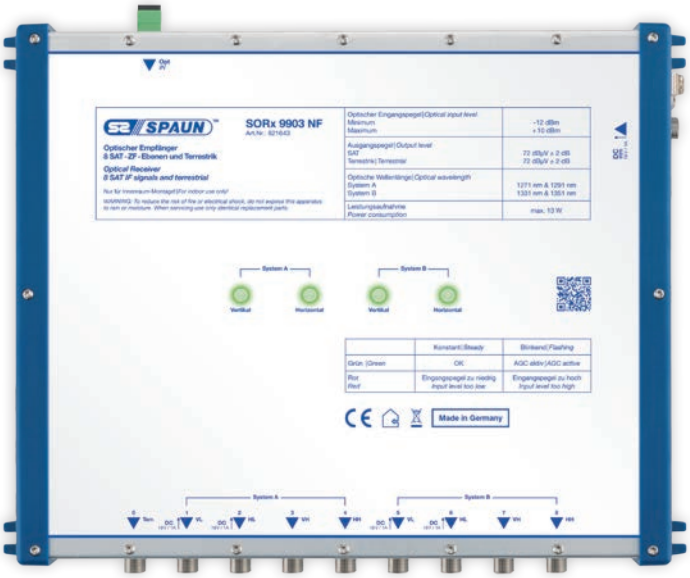
Cards for the L_BOX system

The picture shows the L_Card Master
(L_Card Slaves without terrestrial and RJ-45 input).

Modell Art. Nr.	L_Card Master 821510	L_Card Slave 1 821511	L_Card Slave 2 821512	L_Card Slave 3 821513
EAN	4040326215104	4040326215111	4040326215128	404032621515
Inputs SAT/terrestrial	5 4/1	4 4/0	4 4/0	4 4/0
Input frequency range SAT	950 ... 2150 MHz	950 ... 2150 MHz	950 ... 2150 MHz	950 ... 2150 MHz
AGC level range SAT	71 ... 101 dBµV	71 ... 101 dBµV	71 ... 101 dBµV	71 ... 101 dBµV
Input frequency range terrestrial	47 - 862 MHz	-	-	-
AGC level range terrestrial	78 ... 98 dBµV	-	-	-
LNB remote power	12/18 V 22 kHz oder 12 V	12/18 V 22 kHz oder 12 V	12/18 V 22k Hz oder 12 V	12/18 V 22 kHz oder 12 V
LNB current	max. 400 mA	max. 400 mA	max. 400 mA	max. 400 mA
Optical output power	6,5 dBm	6,5 dBm	6,5 dBm	6,5 dBm
Optical wavelength*	1271 & 1291 nm	1331 & 1351 nm	1371 & 1470 nm	1490 & 1570 nm

Optical Receivers for the L_BOX SOTx system





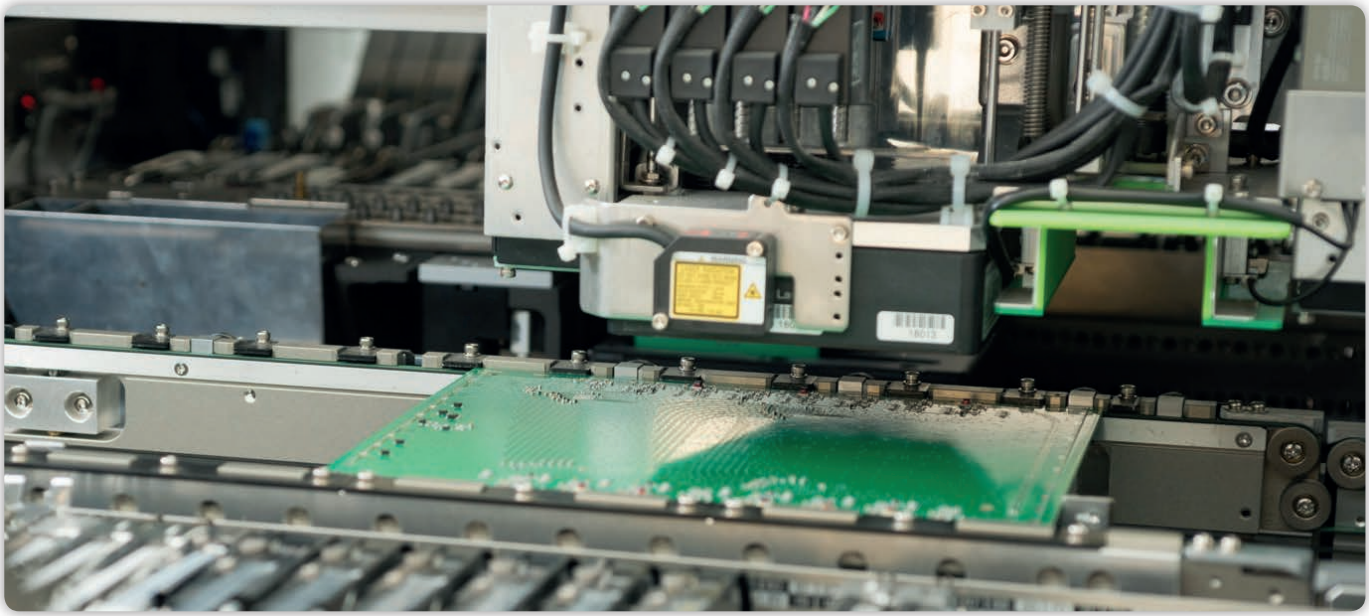
SORx 5503 NF, SORx 9903 NF, SORx 171703 NF

To convert the optical signal from the L_BOX SOTx back to an electrical coaxial signal there are 3 optical receivers available. Starting from the SORx 5503 NF when only 4 SAT IF lines are required to the SORx 171703 NF if 16 SAT IF signals are necessary.

Features:

- The optical input level range of the optical receiver is between -12 dBm and +10 dBm.
- LED status notification:
  - Green LED: AGC is leveled, everything is OK.
  - Red LED: The optical input level is too low.
  - Red flashing LED: The optical input level is too high.
- The optical receiver could either be powered via an external wall power supply or by the trunk lines of the connected launch amplifier.
- External power supply included in scope of delivery.

Model Art. No.	SORx 5503 NF 821642	SORx 9903 NF 821643	SORx 171703 NF 821645
EAN	4040326216422	4040326216439	4040326216453
Optical input power Minimum Maximum	 -12 dBm +10 dBm	 -12 dBm +10 dBm	 -12 dBm +10 dBm
Output level SAT/terrestrial	72 dBµV ± 2 dB		
Optical wavelength System A System B System C System D	 1271 & 1291 nm - - -	 1271 & 1291 nm 1331 & 1351 nm - -	 1271 & 1291 nm 1331 & 1351 nm 1371 & 1470 nm 1490 & 1570 nm
Power consumption	max. 7 W	max. 13 W	max. 24 W
Ambient temperature	-10…+50 °C	-10…+50 °C	-10…+50 °C
Dimensions (mm)	185 x 130 x 40	265 x 210 x 40	425 x 210 x 40

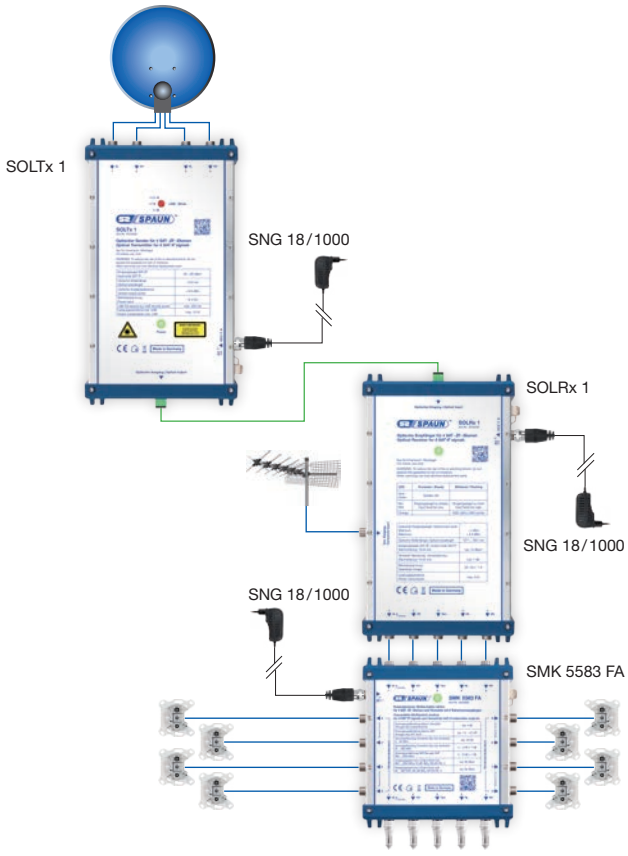


Optical Transmitter for 4 SAT IF signals

SOLTx 1

- The optical transmitter convert the electrical input signal of up to 4 SAT IF signals on one single fibre optics cable.
- The SOLTx 1 uses a Fabry-Pérot-Laser.
- Optical output power: +6.5 dBm.
- Optical wavelength: 1310 nm.
- A distribution of up to 8 optical nodes is possible.
- A LNB mode switch offers the possibility to use either Quattro or QUAD LNB.
- The transmitter can be integrated easly into existing SPAUN 5 wire cascades.
- Optical connector: SC/APC
- Power LED
- Power is supplied via the DC IN connection (F-socket) 18 V / 1 A.
- External power supply included in scope of delivery (SNG 18/1000).

Model Art. No.	SOLTx 1 815048
EAN	4040326150481
Inputs outputs	4 x F-connector 1 x optical
Optical connector	SC/APC
Frequency range	950...2200 MHz
Optical wavelength	1310 nm
Optical output power	+ 6.5 dBm
Input level max. SAT 950...2200 MHz AGC-controlled	65...85 dBµV
Operating voltage (F-socket)	DC 18 V/1000 mA
LNB remote power	max. 350 mA
Power consumption incl. LNB	max. 15 W
Ambient temperature	-10...+50 °C
Dimensions (mm)	225 x 130 x 40

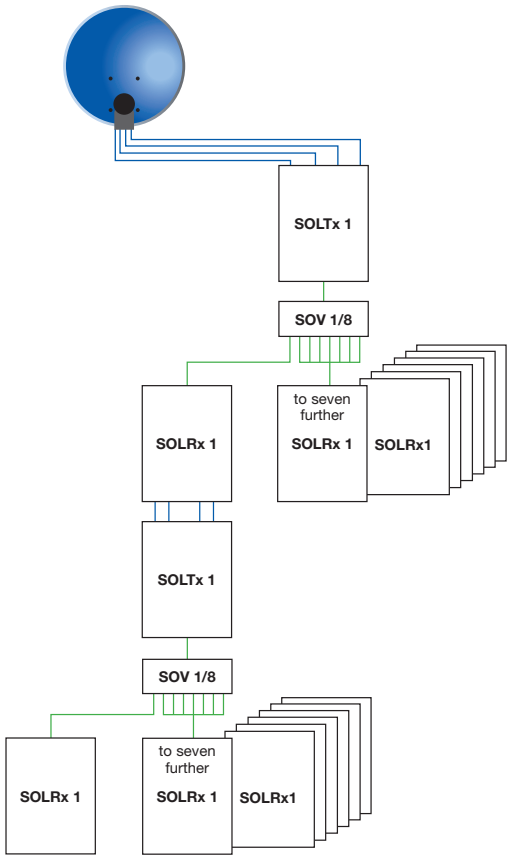


Optical distribution of 4 SAT IF signals and terrestrial

Optical Receiver for 4 SAT IF signals

SOLRx 1

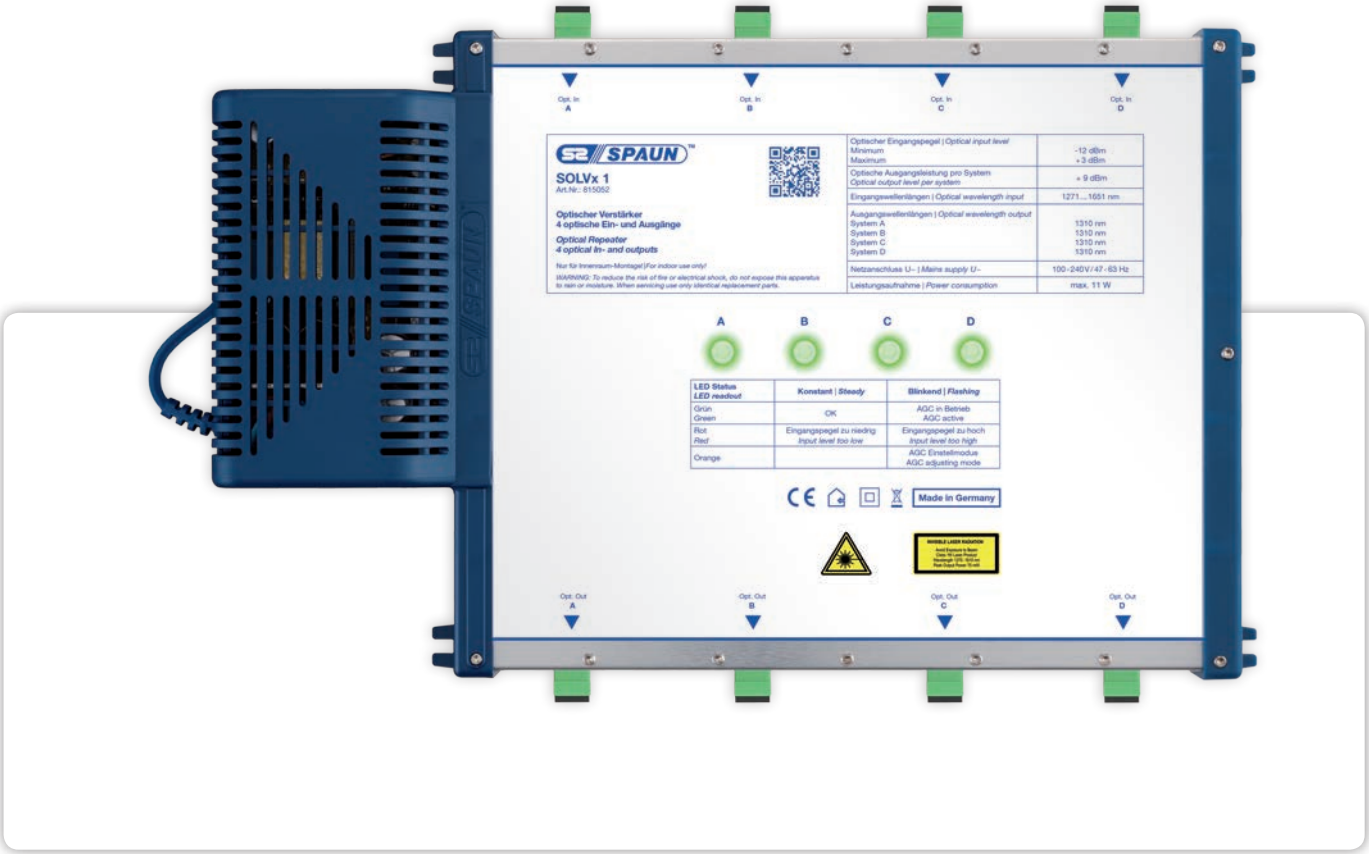
- Optical input sensivity in the range of +6,5 dBm ... -4 dBm.
- The optical receiver offers AGC control for a constant output level of approx. 75 dBµV on the trunk line outputs.
- Terrestrial input connector.
- The optical receiver can be integrated easly into existing SPAUN 5 wire cascades.
- Optical connector: SC/APC.
- Power LED.
- Power is supplied via the DC IN connection (F-socket) 18 V / 1 A.
- External power supply included in scope of delivery (SNG 18/1000).



Optical distribution of up to 64 optical nodes

Model Art. No.	SOLRx 1 815049
EAN	4040326150498
Inputs outputs	1 x F connector (terrestrial) 1 x optical (SAT IF) 5 x F connector
Optical connector	SC/APC
Frequency range	47 ... 2200 MHz
Optical wavelengths	1271 ... 1651 nm
Optical input power	+6,5 ... -4 dBm
Output level SAT IF	typ. 75 dBµV
Terrestrial loss	typ. 1 dB
Operating voltage (F-socket)	DC 18 V/1000 mA
Power consumption	max. 8 W
Ambient temperature	-20 ... +50 °C
Dimensions (mm)	225 x 130 x 40

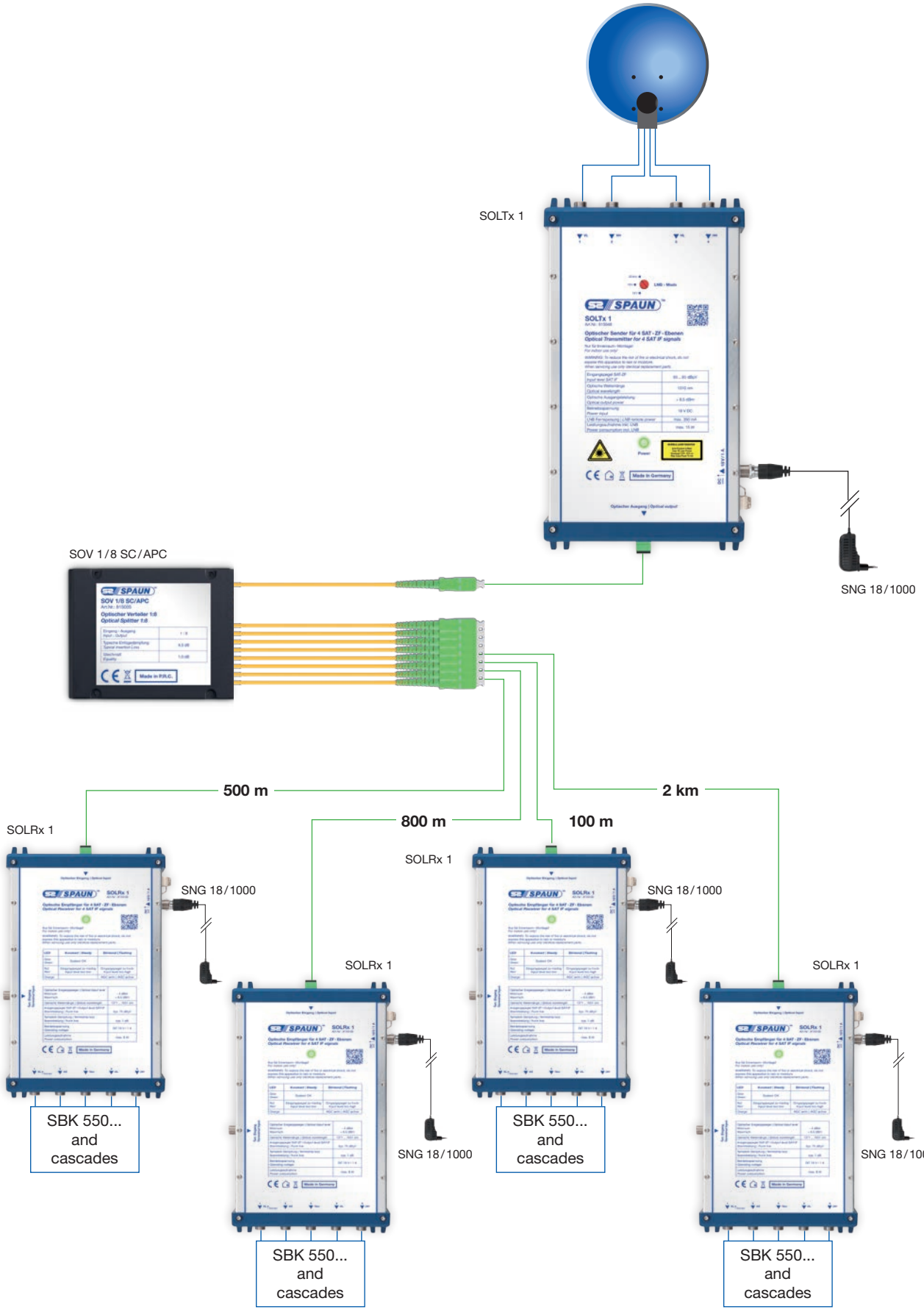
Optical Repeater for up to 4 x 4 SAT IF signals



SOLVx 1

- The optical repeater is used to amplify the optical signal when further distribution levels/points are needed. For this purpose the SOLVx 1 offers an optical - electrical conversion. After that the RF signal is amplified. An AGC control takes care for a consistent signal level. Afterwards the conversion from electrical back to optical is performed. With this repeated optical and electrical signal further distribution points/levels can be realized.
- The device is intended for the use with the transmitter (SOLTx 1) and optical receiver (SOLRx 1).
- LEDs for status notification of the AGC control.
- Optical connector: SC/APC.

Modell Art. Nr.	SOLVx 1 815052
EAN	4040326150528
Inputs outputs	4 x optical 4 x optical
Optical connector	SC/APC
Opitcal input power	-12 dBm + 3 dBm
Optical output power	+9 dBm
Optical input wavelength	1271...1651 nm
Optical output wavelength	1310 nm
Mains power supply U ~	100 - 240 V / 47–63 Hz
Power consumption	max. 11 W
Ambient temperature	-20...+50 °C
Dimensions (mm)	330 x 225 x 56



Optical distribution of 4 SAT IF signals on 8 optical nodes then subsequently cascadable system.

Optical Transmitter for 1 SAT IF signal and terrestrial

AURORA SOTx transmitter

- The transmitter converts one SAT IF signal into an optical signal.
  In addition, a terrestrial signal can also be fed in (up to 25 carriers).
- Single-mode DFB-Laser
- Optical output power: +9 dBm
- AGC controlled amplifier stages using split band technology for terrestrial and SAT IF signals.
- Optical connector: FC/APC
- Test socket (-30 dB)
- Power is supplied via the DC IN connection (F-socket) 18 V / 1 A (e.g. SNG 18/1000).
- External power supply not included in scope of delivery.

Model Art. No.:	AURORA SOTx 827100
EAN	4040326271001
Inputs Outputs	1 x F-socket 1 x optical
Optical connector	FC/APC
Frequency range SAT IF Terrestrial	 950 ... 2600 MHz 47 ... 862 MHz
Optical wavelength	1310 nm
Optical output power	+ 9 dBm
Input level Terr. 47...862 MHz	typ. 75 ... 105 dBµV
Input level SAT 950...2600 MHz	typ. 70 ... 100 dBµV
Operating voltage (F-socket)	DC 18 V/1000 mA
LNB remote power	18 V / 350 mA
Current consumption at 18 V without LNB	max. 210 mA
Ambient temperature	-20...+50 °C
Dimensions (mm)	145 x 113 x 56

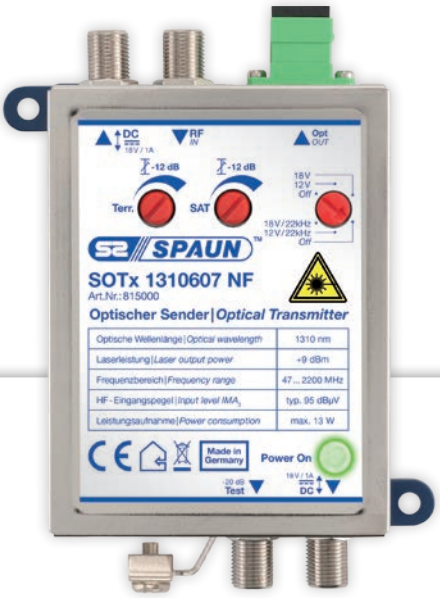
Optical Receiver for 1 SAT IF signal and terrestrial

AURORA SORx receiver

- The receiver convert the optical signal back to SAT IF and/or terrestrial.
- Input sensitivity in the range of +3 … -8 dBm.
- Optical connector: FC/APC
- Power is supplied via the DC IN connection (F-socket) 18 V / 1 A (e.g. SNG 18/1000), or remote power supply via the coaxial output.
- External power supply not included in scope of delivery.

Model Art. No.:	AURORA SORx 827101
EAN	4040326271018
Inputs Outputs	1 x otpical 1 x F-socket
Optical connector	FC/APC
Frequency range SAT IF Terrestrial	 950 ... 2600 MHz 47 ... 862 MHz
Optical wavelength	1270 ... 1650 nm
Optical input power max.	+ 3 dBm
Optical input power min.	- 8 dBm
Output level Terr. 47 ... 862 MHz	typ. 75 dBµV (-8 dBm opt. input signal) typ. 97 dBµV (+3 dBm opt. input signal)
Output level SAT 950 ... 2600 MHz	typ. 75 dBµV (-8 dBm opt. input signal) typ. 97 dBµV (+3 dBm opt. input signal)
Operating voltage DC IN (F-socket) or remote power	DC 18 V/1000 mA
Current consumption at 18 V	max. 60 mA
Ambient temperature	-20...+50 °C
Dimensions (mm)	145 x 113 x 56

Optical Transmitter for 1 SAT IF signal and terrestrial

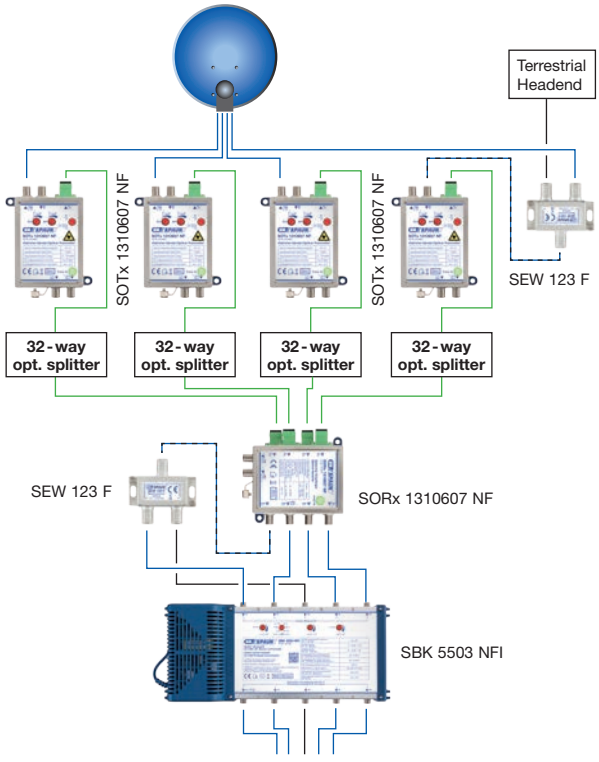


SOTx 1310607 NF

- The transmitter converts one SAT IF signal into an optical signal. In addition, a terrestrial signal can also be fed in (up to 25 carriers).
- Single-mode DFB-Laser
- Optical output power: +9 dBm
- Integrated amplifier stages using split band technology for terrestrial and SAT IF signals.
- Level adjuster for terrestrial and SAT IF (0…-12 dB).
- Remote power to LNB possible (Quattro or QUAD).
- 5 dB slope pre-compensation for the SAT IF range.
- Optical connector: SC/APC
- Power LED
- Power is supplied via the DC IN connection (F-socket) 18 V / 1 A.
- External power supply included in scope of delivery (SNG 18/1000).

Model Art. No.	SOTx 1310607 NF 815000
EAN	4040326150009
Inputs outputs	1 F connector 1 optical
Optical connector	SC/APC
Frequency range	47...862 MHz & 950 ... 2200 MHz
Optical wavelength	1310 nm
Optical output power	+9 dBm
Gain 47…862 MHz 950…2200 MHz	 14 dB ± 1 dB 16…21 dB ± 1 dB
Input level max. Terr. 47…862 MHz 60 dB IMA_3/EN 60728-3	typ. 95 dBµV
Input level max. SAT 950…2200 MHz 35 dB IMA_3/EN 60728-3	typ. 95 dBµV
Level adjuster	0…-12 dB
Operating voltage DC IN (F-socket)	DC 18 V/1000 mA
LNB remote power	max. 350 mA
Power consumption incl. LNB	max. 13 W
Ambient temperature	-20…+50°C
Dimensions (mm)	70 x 120 x 50

Application sample



Sub-distribution

Optical Receivers for 1 SAT IF signal and terrestrial

SORx 1310607 NF
SORx 1310607/1 NF

- The receivers convert the optical signal back to SAT IF and/or terrestrial.
- Input sensitivity in the range of 0…-12 dBm.
- Optical connector: SC/APC
- Power LED
- Power is supplied via the DC IN connection (F-socket) 18 V / 1 A (e.g. SNG 18/1000), or remote power supply via a coaxial output.
- SORx 1310607/1 NF has just one optical input.
- External power supply not included in scope of delivery.

Model Art. No.	SORx 1310607 NF 815001
EAN	4040326150016
Inputs outputs	4 optical 4 F connectors
Optical connector	SC/APC
Frequency range	47…862 MHz & 950 … 2200 MHz
Optical wavelength	1270 … 1650 nm
Optical input power max.	0 dBm
Optical input power min.	-12 dBm
Output level max. Terr. 47…862 MHz 60 dB IMA_3/EN 60728-3	typ. 100 dBµV
Output level max. SAT 950…2200 MHz 35 dB IMA_3/EN 60728-3	typ. 110 dBµV
Operating voltage (F-socket) or remote power	DC 18 V / 1000 mA
Power consumption	max. 7 W
Ambient temperature	-20…+50°C
Dimensions (mm)	100 x 100 x 50

Model Art. No.	SORx 1310607/1 NF 814999
EAN	4040326149997
Input output	1 optical 1 F connector
Optical connector	SC/APC
Frequency range	47…862 MHz & 950 … 2200 MHz
Optical wavelength	1270 … 1650 nm
Optical input power max.	0 dBm
Optical input power min.	-12 dBm
Output level max. Terr. 47…862 MHz 60 dB IMA_3/EN 60728-3	typ. 100 dBµV
Output level max. SAT 950…2200 MHz 35 dB IMA_3/EN 60728-3	typ. 110 dBµV
Operating voltage (F-socket) or remote power	DC 18 V / 1000 mA
Power consumption	max. 3 W
Ambient temperature	-20…+50°C
Dimensions (mm)	100 x 100 x 50

Optical transmitter for CATV signals

SOLAS SOTx transmitter

- The transmitter converts one CATV signal into an optical signal.
- Single-mode DFB-Laser
- Optical output power: +11 dBm
- Level adjuster (0…-12 dB).
- Optical connector: SC/APC
- Power LED

Model Art. No.	SOLAS SOTx 815054
EAN	4040326150542
Inputs Outputs	1 x F-socket 1 x optical connector 2 x F-socket (test jack)
Optical connector	SC/APC
Frequency range	47…1006 MHz
Optical wavelength	1550 nm
Optical output power	+11 dBm
Input level range Terr. 47 ... 1006 MHz	typ. 66 - 78 dBµV
Level adjuster	0 ... - 12 dB
Mains power U ~	100 - 240 V / 47–63 Hz
Power consumption	max. 12 W
Ambient temperature	-20...+50 °C
Dimensions (mm)	260 x 130 x 52

Optical receiver for CATV signals

SOLAS SORx receiver

- The receiver converts the optical signal back to an electrical signal.
- Optical input sensitivity range from +1 ... -12 dBm.
- Test jack with -25 dB (on the output side).
- The device has an AGC control.
- Equipped with a LED (AGC control)
- Optical connector: SC/APC

Model Art. No.	SOLAS SORx 815055
EAN	4040326150559
Inputs Outputs	1 x optical connector 1 x F-socket 1 x F-socket (test jack)
Optical connector	SC/APC
Frequency range	47 ... 1006 MHz
Optical wavelengths	1270 ... 1650 nm
Optical input power max.	+1 dBm
Optical input power min.	-12 dBm
Output level Terr. 47 ... 1006 MHz	typ. 76 dBµV
AGC- control range	0 ... -10 dB
Mains power U ~	100 - 240 V / 47–63 Hz
Power consumption	max. 8 W
Ambient temperature	-20 ... +50 °C
Dimensions (mm)	260 x 130 x 52

Optical Splitters

SOV 1/2 SC/APC, SOV 1/3 SC/APC
SOV 1/4 SC/APC, SOV 1/8 SC/APC
SOV 1/16 SC/APC, SOV 1/32 SC/APC

- The devices are used to distribute an optical signal to several outputs.
- Usable for wavelengths between 1271 to 1651 nm.
- Optical connector: SC/APC.

Model Art. No.	SOV 1/2 SC/APC 815002	SOV 1/3 SC/APC 815003	SOV 1/4 SC/APC 815004	SOV 1/8 SC/APC 815005	SOV /16 SC/APC 815019	SOV 1/32 SC/APC 815020
EAN	4040326150023	4040326150030	4040326150047	4040326150054	4040326150191	4040326150207
Optical wavelength	1271...1651 nm					
Optical connector	Input and output SC/APC					
Input/output	1:2	1:3	1:4	1:8	1:16	1:32
Typical insertion loss*	3,2 dB	4,9 dB	6,3 dB	9,5 dB	12,5 dB	15,8 dB
Insertion loss* max.	4,3 dB	6,2 dB	7,4 dB	10,7 dB	13,9 dB	17,2 dB
Equality	0,5 dB	0,6 dB	0,8 dB	1,0 dB	1,4 dB	1,6 dB
Optical output isolation	50 dB					
Ambient temperature	-20…+50°C					
Dimensions (mm)**	100 x 80 x 10				120 x 80 x 19	

* Without connectors. ** Without cable and connectors.

SOV 1/2 FC/PC, SOV 1/3 FC/PC
SOV 1/4 FC/PC, SOV 1/8 FC/PC
SOV 1/16 FC/PC, SOV 1/32 FC/PC

- The devices are used to distribute an optical signal to several outputs.
- Usable for wavelengths between 1271 to 1651 nm.
- Optical connector: FC/PC.

Model Art. No.	SOV 1/2 FC/PC 815035	SOV 1/3 FC/PC 815036	SOV 1/4 FC/PC 815037	SOV 1/8 FC/PC 815038	SOV 1/16 FC/PC 815039	SOV 1/32 FC/PC 815040
EAN	4040326150351	4040326150368	4040326150375	4040326150382	4040326150399	4040326150405
Optical wavelength	1271...1651 nm					
Optical connector	Input and output FC/PC					
Input/output	1:2	1:3	1:4	1:8	1:16	1:32
Typical insertion loss*	3,2 dB	4,9 dB	6,3 dB	9,5 dB	12,5 dB	15,8 dB
Insertion loss* max.	4,3 dB	6,2 dB	7,4 dB	10,7 dB	13,9 dB	17,2 dB
Equality	0,5 dB	0,6 dB	0,8 dB	1,0 dB	1,4 dB	1,6 dB
Optical output isolation	50 dB					
Ambient temperature	-20…+50°C					
Dimensions (mm)**	100 x 80 x 10				120 x 80 x 19	

* Without connectors. ** Without cable and connectors.

Optical Tap

SOC 10/90 SC/APC, SOC 20/80 SC/APC
SOC 30/70 SC/APC, SOC 40/60 SC/APC

- The devices are used to distribute an optical signal to several outputs.
- Usable for wavelengths between 1271 to 1651 nm.
- Optical connector: SC/APC.

Model Art. No.	SOC 10/90 SC/APC 815044	SOC 20/80 SC/APC 815045	SOC 30/70 SC/APC 815046	SOC 40/60 SC/APC 815047
EAN	4040326150443	4040326150450	4040326150467	4040326150474
Optical wavelength	1271...1651 nm			
Optical connector	Input and output SC/APC			
Input/output	1:2	1:2	1:2	1:2
Typical insertion loss signal	< 0,6 dB	< 1,2 dB	< 1,8 dB	< 2,5 dB
Typical insertion loss tap	11 dB	7,5 dB	5,5 dB	4 dB
Coupling ratio	10:90	20:80	30:70	40:60
Directivity	≥ 55			
Ambient temperature	-20...+50°C			
Dimensions (mm)*	100 x 80 x 10			

* Without cable and connectors.

Optical Connector Cleaner

Model Art. No.	OptiClean 500 814997
EAN	4040326149973
Dimensions (mm)	125 x 85 x 35

OptiClean 500

The OptiClean 500 cleans variety of UPC and APC connectors such as SC, FC, LC, ST, MU, E2000 and more.

- Each cleaning tape reel cleans approx. 500 connectors and making the OptiClean 500 a cost effective cleaning tool.
- The special lint free anti-static microfiber fabric cleaning tape traps contaminants without using solvents and alcohol.

Optical Splitter 19“ housing

SOV 19 1/8 SC/APC, SOV 19 1/16 SC/APC, SOV 19 1/32 SC/APC

- The devices are used to distribute an optical signal to several outputs.
- Usable for wavelengths between 1271 to 1651 nm.
- 19“ housing (1 HU).

Model Art. No.	SOV 19 1/8 SC/APC 821647	SOV 19 1/16 SC/APC 821648	SOV 19 1/32 SC/APC 821649
EAN	4040326216477	4040326216484	4040326216491
Optical wavelength	1271...1651 nm		
Optical connector	Input and output SC/APC		
Input/output	1:8	1:16	1:32
Typical insertion loss*	9,5 dB	12,5 dB	15,8 dB
Insertion loss* max.	10,7 dB	13,9 dB	17,2 dB
Equality	1,0 dB	1,4 dB	1,6 dB
Optical output isolation	50 dB		
Ambient temperature	-20 … +50°C		
Dimensions (mm)*	483 x 240 x 45		

* Without connectors.

Optical Splitter 19“ housing

SOV 19 1/8 FC/PC, SOV 19 1/16 FC/PC, SOV 19 1/32 FC/PC

- The devices are used to distribute an optical signal to several outputs.
- Usable for wavelengths between 1271 to 1651 nm.
- 19“ housing (1 HU).

Model Art. No.	SOV 19 1/8 FC/PC 821657	SOV 19 1/16 FC/PC 821656	SOV 19 1/32 FC/PC 821655
EAN	4040326216576	4040326216569	4040326216552
Optical wavelength	1271...1651 nm		
Optical connector	Input and output FC/PC		
Input/output	1:8	1:16	1:32
Typical insertion loss*	9,5 dB	12,5 dB	15,8 dB
Insertion loss* max.	10,7 dB	13,9 dB	17,2 dB
Equality	1,0 dB	1,4 dB	1,6 dB
Optical output isolation	50 dB		
Ambient temperature	-20 … +50°C		
Dimensions (mm)*	483 x 240 x 45		

* Without connectors.

The new AURORA system

(page 20)

AURORA SOTx

- The transmitter converts one SAT IF signal into an optical signal.
  In addition, a terrestrial signal can also be fed in (up to 25 carriers).

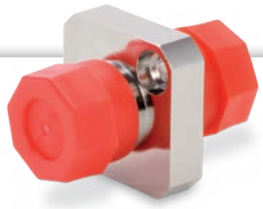
AURORA SORx

- Optical receiver for one SAT IF signal and terrestrial.

Optical Couplers

SOK SC/APC

Optical coupler for SC/APC.



SOK FC/PC

Optical coupler for FC/PC.

SOK FC/PC <> SC/PC

Optical coupler for FC/PC <> SC/PC

Model Art. No.	SOK SC/APC 815006	SOK FC/PC 815027	SOK FC/PC <> SC/PC 815053
EAN	4040326150061	4040326150276	4040326150535
Connector	both sides SC/APC	both sides FC/PC	one-sided FC/PC <> and SC/PC
Ambient temperature	-20…+50°C		
Dimensions (mm)	35 x 22 x 10	21 x 14 x 14	29 x 23 x 10

Optical Attenuation Units

SODE 3 SC/APC, SODE 6 SC/APC
SODE 10 SC/APC, SODE 15 SC/APC

SODE 3 FC/PC, SODE 6 FC/PC
SODE 10 FC/PC, SODE 15 FC/PC

To adjust an optical transmission network normally an attenuation unit is used. These units should prevent damages to an optical network in case that too much light energy is feeded to the sensitive receiver diodes.

Model Art. No.	SODE 3 SC/APC 815015	SODE 6 SC/APC 815016	SODE 10 SC/APC 815013	SODE 15 SC/APC 815017
EAN	4040326150155	4040326150162	4040326150139	4040326150179
Loss	3 dB	6 dB	10 dB	15 dB
Optical connector	both sides SC/APC	both sides SC/APC	both sides SC/APC	both sides SC/APC
Optical wavelength	1271…1651 nm			
Ambient temperature	-20…+50°C			
Dimensions (mm)	42 x 13 x 10			

Model Art. No.	SODE 3 FC/PC 815028	SODE 6 FC/PC 815029	SODE 10 FC/PC 815021	SODE 15 FC/PC 815031
EAN	4040326150283	4040326150290	4040326150214	4040326150313
Loss	3 dB	6 dB	10 dB	15 dB
Optical connector	both sides FC/PC	both sides FC/PC	both sides FC/PC	both sides FC/PC
Optical wavelength	1271…1651 nm			
Ambient temperature	-20…+50°C			
Dimensions (mm)	35 x 10 Ø			

SAT IF Distribution

TABLE OF CONTENTS

Compact Multiswitch with active terrestrial 17 in 8 and 16

SMS 17807 NF
SMS 171607 NF

For 8 and 16 subscribers.

Both devices feature 16 active SAT IF inputs and an active terrestrial input.

SAT IF:

- Can be used with Quattro or QUAD LNBs.
- The multiswitch supports standby mode.
  Both the SAT IF amplifier, as well as the remote power supply of the LNBs are only active if at least one receiver provides a supply voltage to the multiswitch outlet.

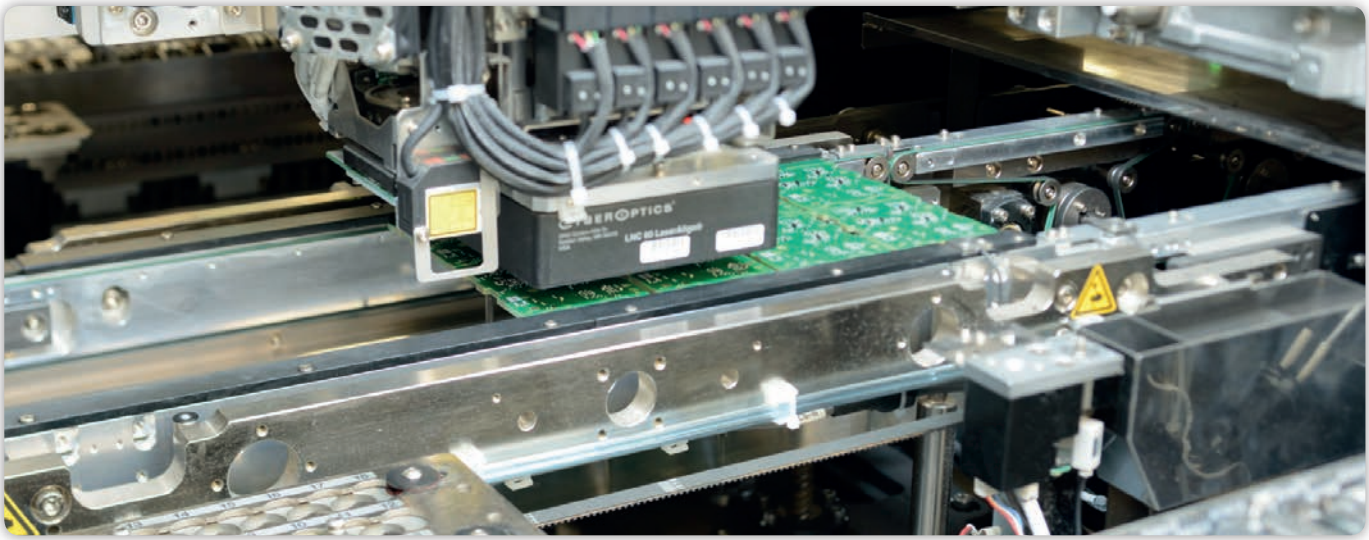
Terrestrial:

- Active forward path 85 … 862 MHz.
- Passive return path 5 … 65 MHz for the use of interactive signals (Triple Play).

Miscellaneous:

- The devices are equipped with a switched-mode power supply.

Model Art. No.		SMS 17807 NF 842500	SMS 171607 NF 842501
EAN		4040326425008	4040326425015
Inputs SAT/terrestrial		17 16/1	
Subscriber outputs		8	16
Tap loss Terr. passive 5…65 MHz		18 dB ± 1 dB	22…23 dB ± 1 dB
Tap loss Terr. active 85…862 MHz		4…1 dB ± 1 dB	5…4 dB ± 1 dB
Tap gain SAT IF 950…2200 MHz		-5…2,5 dB ± 1 dB	-6…1,5 dB ± 1 dB
Output level max. 85…862 MHz 60 dB IMA_3/EN 60728-3		typ. 92 dBµV	typ. 88 dBµV
Output level max. 950…2200 MHz 35 dB IMA_3/EN 60728-3		typ. 95 dBµV	typ. 95 dBµV
Selection	SAT/terrestrial	typ. 40 dB	
	terrestrial/SAT	typ. 40 dB	
Isolation	Switching isolation	typ. 35 dB	
	receiver/receiver	typ. 35 dB	
Mains power supply U~		100-240 V/47-63 Hz	
Power consumption terrestrial active/SAT active incl. LNB load with 1200 mA		max. 32 W	max. 35 W
Power consumption SAT standby		max. 2,5 W	max. 2,5 W
LNB-total remote current		max. 1200 mA	
LNB-single remote current		max. 300 mA	
Current consumption from receiver		< 20 mA	
Ambient temperature		-20…+ 50 °C	
Dimensions (mm)		240 x 266 x 68	318 x 266 x 68

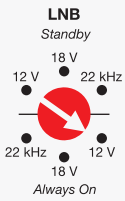


Launch Amplifier 17 in 8

LED control

- Green = active
- Yellow = standby
- Red = DC-error

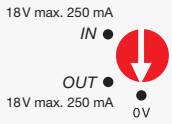
LNB supply voltage



Selectable for Quattro or QUAD LNB.

Standby or continuous operation mode selectable.

Supply voltage



0 V / 18 V selectable.

Synchronous level adjuster

For each SAT IF system.

17 DC-decoupled terminating resistors are shipped with the SMS 17089 NF to terminate the trunk lines.
ZFR 75 DC / Set (Art.No.: 871511)

SMS 17089 NF

Usable as stand-alone switch for 8 subscribers; for cascading with SMK 17xx9 F(A); as post amplifier or to terminate a cascadable system.

SAT IF:

- Synchronous level adjuster for each SAT IF system.
- LNB supply voltage selectable for the use of Quattro or QUAD LNBs.
- The device has a standby function:
  Both the SAT IF amplifier, as well as the remote power supply of the LNBs are only active if at least one receiver provides a supply voltage to the multiswitch outlet.

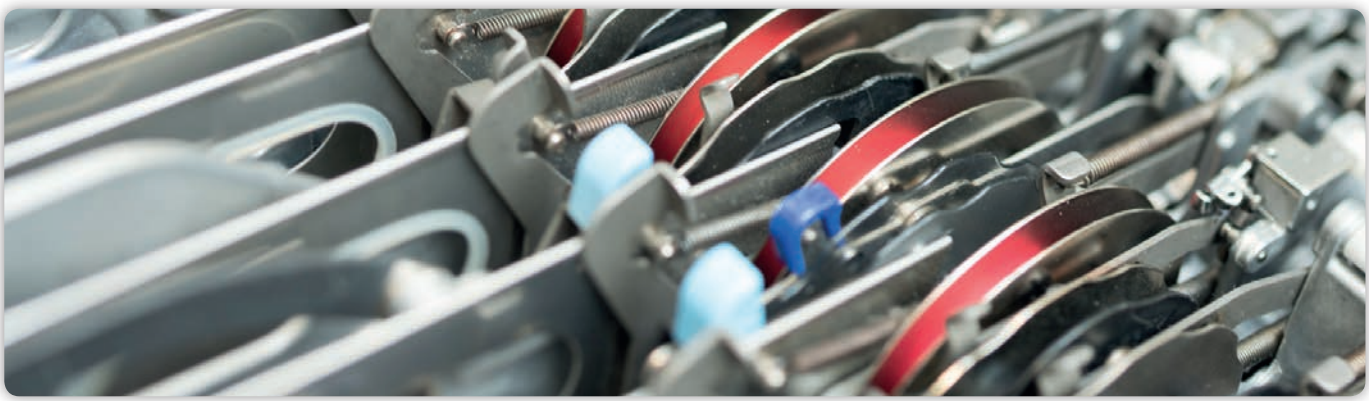
Terrestrial:

- The terrestrial input is passive and return path compatible with the possibility of a 18 V (250 mA) remote power on terrestrial trunk line for an external amplifier.

Miscellaneous:

- The device is equipped with a switched-mode power supply.

Model Art. No.	SMS 17089 NF 842425
EAN	4040326424254
Inputs/outputs SAT/terrestrial	17/17 16/1
Subscriber outputs	8
Tap loss Terr. 5 … 862 MHz	19,5 … 21,5 dB ± 1 dB
Tap gain SAT 950 … 2200 MHz	-4 … 5 dB ± 1 dB
Loss trunk line Terr. 5 … 862 MHz	typ. 5 dB
Gain trunk line SAT 950 … 2200 MHz	18 … 21 dB ± 1 dB
Output level max. SAT 950 … 2200 MHz 35 dB IMA_3/EN 60728-3	typ. 110 dBµV
Rejection SAT/terrestrial terrestrial/SAT	typ. 35 dB typ. 35 dB
Isolation trunk/trunk	typ. 30 dB
Isolation receiver/receiver	typ. 28 dB
Mains power supply U~	100-240 V/47-63 Hz
Power consumption terrestrial 18 V/250 mA incl. LNB load with 1200 mA	max. 55 W
Power consumption terrestrial 0 V incl. LNB load with 1200 mA	max. 49 W
Power consumption standby/terrestrial 18 V/250 mA	max. 8 W
Power consumption standby/terrestrial 0 V	max. 2 W
LNB-total remote current	max. 1200 mA
LNB-single remote current	max. 300 mA
Remote current terrestrial	max. 18 V / 250 mA
Current consumption from receiver	25 mA
Ambient temperature	-20 … +50 °C
Dimensions (mm)	490 x 211 x 56



Power Launch Amplifier for large distribution networks / 17 inputs

LED control

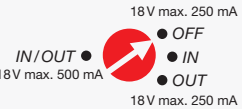
- Green = active
- Yellow = standby
- Red = DC-error

LNB supply voltage

Selectable for Quattro or QUAD LNB.

Standby or continuous operation mode selectable.

Supply voltage



0 V / 18 V selectable.

Synchronous level adjuster

For each SAT IF system.

17 DC-decoupled terminating resistors are shipped with the SBK 171709 NF to terminate the trunk lines.
ZFR 75 DC / Set (Art.No.: 871511)

SBK 171709 NF

Power Launch Amplifier for cascading with SMK 17xx9 F(A).

SAT IF:

- Synchronous level adjuster for each SAT IF system.
- The device has a standby function:
  Both the SAT IF amplifier, as well as the remote power supply of the LNBs are only active if at least one receiver provides a supply voltage to the multiswitch outlet.

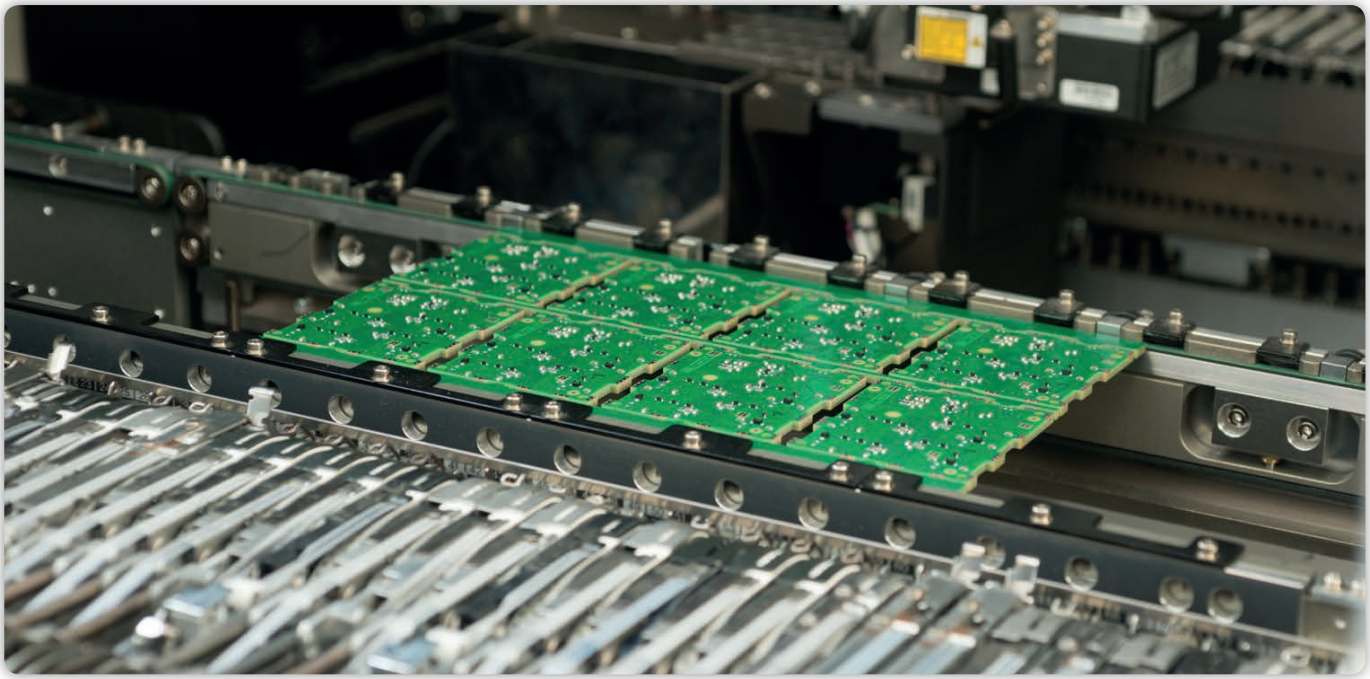
Terrestrial:

- The terrestrial input is passive and return path compatible with the possibility of a 18 V (250 mA) remote power in both directions for an external amplifier.

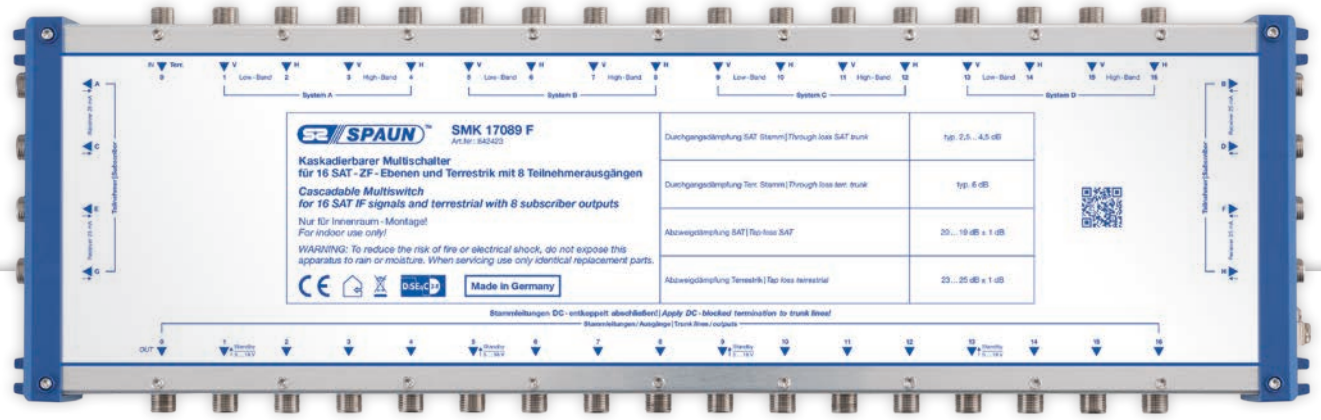
Miscellaneous:

- The device is equipped with a switched-mode power supply.

Model Art. No.		SBK 171709 NF 842428
EAN		4040326424285
Inputs/outputs SAT/terrestrial		17/17 16/1
Loss Terr. 5…862 MHz		typ. 0 …3 dB
Gain SAT IF 950…2200 MHz		25…33 dB ± 1 dB
Output level max. 950…2200 MHz 35 dB IMA_3/EN 60728-3		typ. 117 dBµV
Rejection	terrestrial/SAT	typ. 45 dB
	SAT/terrestrial	typ. 40 dB
Isolation trunk/trunk		typ. 30 dB
Power supply U~		100-240 V/47-63 Hz
Power consumption Terr. 18 V/500 mA incl. LNB load with 1600 mA		max. 80 W
Power consumption Terr. 0 V incl. LNB load with 1600 mA		max. 69 W
Power consumption standby/terrestrial 18 V/500 mA		max. 15 W
Power consumption standby/terrestrial 0 V		max. 4 W
LNB-total remote current		max. 1600 mA
LNB-single remote current		max. 400 mA
Remote current terrestrial		max. 18 V / 500 mA
Ambient temperature		-20…+50 °C
Dimensions (mm)		540 x 170 x 100



Cascadable Multiswitches 17 in 8, 12 ,16



Only usable in combination with the Launch Amplifiers **SMS 17089 NF** or **SBK 171709 NF**.

DiSEqC 2.0

SMK 17xx9 F
SMK 17xx9 FA (active)

For 8, 12 or 16 subscribers either as an active version with amplification in the SAT IF path (SMK 17xx9 FA) or as a completely passive version (SMK 17xx9 F).

Model Art. No.	SMK 17089 F 842423	SMK 17129 F 842426	SMK 17169 F 842424	SMK 17089 FA 842469	SMK 17129 FA 842470	SMK 17169 FA 842471
EAN	4040326424230	4040326424261	4040326424247	4040326424698	4040326424704	4040326424711
Inputs/outputs SAT/terrestrial	17/17 16/1					
Frequency range	5…862 MHz 950…2200 MHz					
Subscriber outputs	8	12	16	8	12	16
Through loss terr. trunk	typ. 6 dB	typ. 6 dB	typ. 6 dB	typ. 6 dB	typ. 6 dB	typ. 6 dB
Through loss SAT trunk	typ. 2,5…4,5 dB	typ. 3…7 dB	typ. 3…7 dB	typ. 2,5…4,5 dB	typ. 3…7 dB	typ. 3…7 dB
Tap loss terrestrial	23…25 dB	25…27 dB	27…29 dB	23…25 dB	25…27 dB	27…29 dB
Tap loss SAT	20…19 dB	22…20 dB	23…21 dB	5,5…-1,5 dB	7…0 dB	7…1 dB
Output level max. 950…2200 MHz 35 dB IMA_3/EN 60728-3	-	-	-	typ. 110 dBµV	typ. 110 dBµV	typ. 110 dBµV
Current consumption from receiver	25 mA			75 mA		
Isolation trunk/trunk	typ. 30 dB					
Isolation receiver/receiver	typ. 30 dB					
DC pass through Trunk line 0; 2…16 *	max. 20 V / 1 A					
Ambient temperature	-20…+50 °C					
Dimensions (mm)	425 x 130 x 40	425 x 210 x 40	425 x 210 x 40	425 x 130 x 40	425 x 210 x 40	425 x 210 x 40

* Selective Standby mode. Activation via trunk lines 1, 5, 9 and 13.

Headend Q_BOX 16/32

Q_BOX variants

- Q_BOX 32 DVB-S/S2 into 32 QAM chanels (page 82)
- Q_BOX 16 DVB-S/S2 into 16 QAM chanels (page 82)

Compact Multiswitch with active terrestrial 9 in 8, 16, 24, 32

SMS 9807 NF, SMS 91607 NF
SMS 92407 NF, SMS 93207 NF

For 8, 16, 24 and 32 subscribers.

SAT IF:

- Can be used with Quattro or QUAD LNBs.
- The multiswitch supports standby mode. Both the SAT IF amplifier, as well as the remote power supply of the LNBs are only active if at least one receiver provides a supply voltage to the multiswitch outlet.

Terrestrial:

- Active forward path 85 … 862 MHz.
- Passive return path 5 … 65 MHz for the use of interactive signals (Triple Play).

Miscellaneous:

- The devices are equipped with a switched-mode power supply.

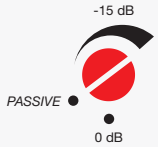
Model Art. No.		SMS 9807 NF 842495	SMS 91607 NF 842496	SMS 92407 NF 842498	SMS 93207 NF 842499
EAN		4040326424957	4040326424964	4040326424988	4040326424995
Inputs SAT/terrestrial		9 8/1			
Subscriber outputs		8	16	24	32
Tap loss Terr. passive 5...65 MHz		17...18 dB ± 1 dB	22...23 dB ± 1 dB	24...25 dB ± 1 dB	25...27 dB ± 1 dB
Tap loss Terr. active 85...862 MHz		2...3 dB ± 1 dB	8...4 dB ± 1 dB	8...5 dB ± 1 dB	10...9 dB ± 1 dB
Tap gain SAT IF 950...2200 MHz		-4...4 dB ± 1 dB	-3...3 dB ± 1 dB	-6...1 dB ± 1 dB	-8...-1 dB ± 1 dB
Output level max. 85...862 MHz 60 dB IMA_3/EN 60728-3		typ. 92 dBµV	typ. 88 dBµV	typ. 92 dBµV	typ. 90 dBµV
Output level max. 950...2200 MHz 35 dB IMA_3/EN 60728-3		typ. 95 dBµV	typ. 95 dBµV	typ. 95 dBµV	typ. 95 dBµV
Selection	SAT/terrestrial	typ. 40 dB			
	Terrestrial/SAT	typ. 40 dB			
Isolation	Switching isolation	typ. 35 dB			
	receiver/receiver	typ. 35 dB			
Mains power supply U~		100-240 V/47-63 Hz			
Power consumption terrestrial active/SAT active incl. LNB load with 600 mA		max. 20 W	max. 22 W	max. 25 W	max. 27 W
Power consumption SAT standby		max. 4 W	max. 4 W	max. 6,5 W	max. 6,5 W
LNB-total remote current		max. 600 mA			
LNB-single remote current		max. 300 mA			
Current consumption from receiver		< 20 mA			
Ambient temperature		-20...+50 °C			
Dimensions (mm)		230 x 211 x 56	330 x 211 x 56	410 x 211 x 56	490 x 211 x 56

Launch Amplifier 9 in 8

DiSEqC 2.0

LNB supply voltage

Selectable for Quattro or QUAD LNB.



This attenuator allows the stepless reduction of the terrestrial signal. After the minimum level is reached the next step is to turn the terrestrial path to passive.

Level attenuator

For each IF input to adjust different input levels.

SMS 9982 NFI

Usable as stand-alone switch for 8 subscribers; for cascading with SMK 99xx9 F(A); as post amplifier or to terminate a cascadable system.

9 DC-decoupled terminating resistors are shipped with the SMS 9982 NFI to terminate the trunk lines.
ZFR 75 DC/Set (Art.No.: 871511)

SAT IF:

- SAT IF amplifiers with precompensating slope.
- SAT IF selection logic: Using the analogue control signals 14/18 V, 0/22 kHz and ToneBurst or the DiSEqC commands Polarity, Band and Position.
- The multiswitch supports standby mode. Both the SAT IF amplifier, as well as the remote power supply of the LNBs are only active if at least one receiver provides a supply voltage to the multiswitch outlet.
- The multiswitche support DiSEqC 2.0. That means bidirectional communication between receiver and multiswitch is possible.

Terrestrial:

- Terrestrial input selectable active/passive.
- Return path for the use of interactive signals (Triple Play).

Miscellaneous:

- The device is equipped with a switched-mode power supply.

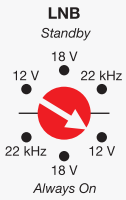
Model Art. No.		SMS 9982 NFI 842257
EAN		4040326422571
Inputs/outputs SAT/terrestrial		9/9 8/1
Subscriber outputs		8
Tap loss Terrestrial passive 5…862 MHz		20…22 dB ± 1 dB
Tap gain Terrestrial active 47…862 MHz		4…3 dB ± 1 dB
Tap gain SAT 950…2200 MHz		- 4…7 dB ± 1 dB
Loss trunk lines terrestrial passive 5…862 MHz		6,5 dB ± 1 dB
Gain trunk lines terrestrial active 47… 862 MHz		18 dB ± 1 dB
Gain trunk lines SAT IF 950…2200 MHz		12…18 dB ± 1 dB
Output level max. 47…862 MHz 60 dB IMA_3/EN 60728-3		typ. 105 dBµV
Output level max. 950…2200 MHz 35 dB IMA_3/EN 60728-3		typ. 109 dBµV
Rejection	Terrestrial passive/SAT	typ. 26 dB
	Terrestrial active/SAT	typ. 30 dB
	SAT/terrestrial	typ. 36 dB
Isolation trunk/trunk		typ. 30 dB
Isolation receiver/receiver		typ. 28 dB
Mains power supply U~		100-240 V /47-63 Hz
Power consumption terrestrial 18V/250 mA incl. LNB load with 700 mA		max. 46 W
Power consumption terrestrial 0V incl. LNB load with 700 mA		max. 36 W
Power consumption standby/terrestrial 18V/250 mA		max. 14 W
Power consumption standby/terrestrial 0V		max. 5 W
LNB-total remote current		max. 700 mA
LNB-single remote current		max. 350 mA
Current consumption from receiver		25 mA
Ambient temperature		-20…+50 °C
Dimensions (mm)		330 x 211 x 56

Launch Amplifier for large distribution networks / 9 inputs

LED control

- Green = active
- Yellow = standby
- Red = DC-error

LNB supply voltage



Selectable for Quattro or QUAD LNB.

Standby or continuous operation mode selectable.

Return path

Selectable: OFF, PASSIVE, Gain selectable: 20, 15, 10 or 5 dB.

Synchronous level adjuster

For each SAT IF position.

9 DC-decoupled terminating resistors are shipped with the SBK 99x5 NF to terminate the trunk lines.
ZFR 75 DC / Set (Art.No.: 871511)

SBK 9965 NF

Launch- and post amplifier for cascading with SMK 99xx Fx.

SAT IF:

- Synchronous level adjuster for each SAT IF system.
- Standby function:
  Both the SAT IF amplifier, as well as the remote power supply of the LNBs are only active if at least one receiver provides a supply voltage to the multiswitch outlet.

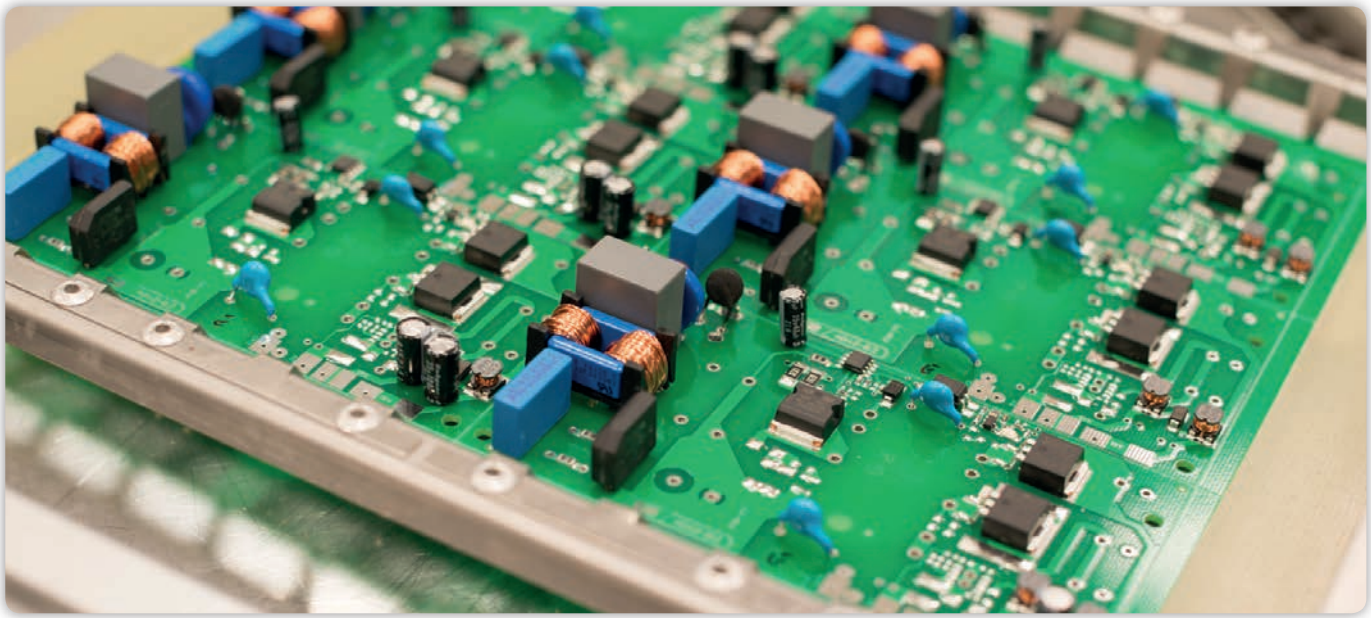
Terrestrial:

- **Forward path:**
  Terrestrial amplifier with pre-emphasis.
- **Return path:**
  Selectable: off, passive, active.
  Gain selectable: 20, 15, 10 or 5 dB.
- CATV compatible.
- Push-pull technology.
- Level adjuster range: 0 … -15 dB.

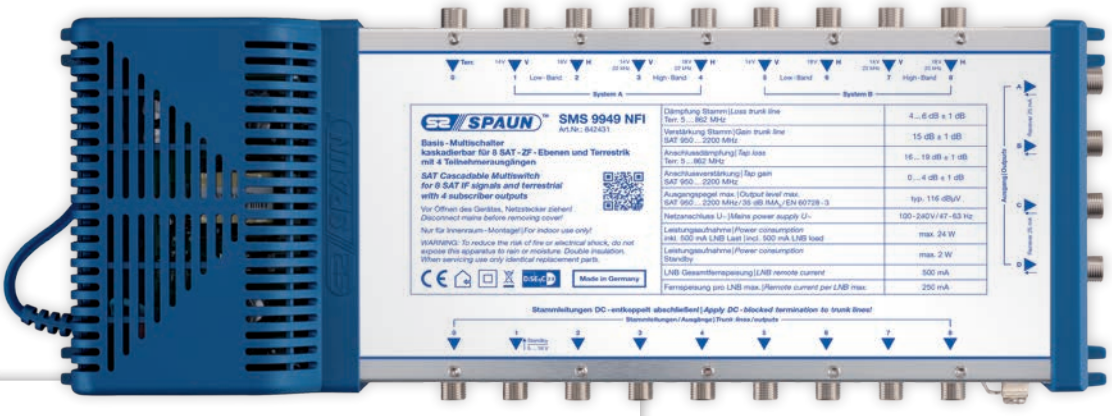
Miscellaneous:

- The device is equipped with a switched-mode power supply.

Model Art. No.		SBK 9965 NF 842400
EAN		4040326424001
Inputs/outputs SAT/terrestrial		9/9 8/1
Return path loss terrestrial passive 5…65 MHz		typ. 2,5 dB
Return path gain terrestrial active 5…65 MHz		5, 10, 15, 20 dB
Gain terrestrial 85…862 MHz		28…31 dB ± 1 dB
Gain SAT IF 950…2200 MHz		27…33 dB ± 1 dB
Output level max. return path 5…65 MHz 60 dB IMA_3/EN 60728-3		typ. 110 dBµV
Output level max. 85…862 MHz 60 dB IMA_3/EN 60728-3		typ. 116 dBµV
Output level 950…2200 MHz max. 35 dB IMA_3/EN 60728-3		typ. 117 dBµV
Rejection	Terrestrial active/SAT	typ. 42 dB
	SAT/terrestrial	typ. 40 dB
Isolation trunk/trunk		typ. 35 dB
Mains power supply U~		100-240 V / 47-63 Hz
Power consumption terrestrial active/SAT active incl. LNB load with 1000 mA		max. 78 W
Power consumption standby		max. 15 W
LNB-total remote current		max. 1000 mA
LNB-single remote current		max. 500 mA
Ambient temperature		-20 …+50 °C
Dimensions (mm)		445 x 190 x 100



Launch Amplifier 9 in 4



DiSEqC 2.0

9 DC-decoupled terminating resistors are shipped with the SMS 9949 NFI to terminate the trunk lines.
ZFR 75 DC/Set (Art.No.: 871511)

SMS 9949 NFI

As stand-alone switch for 4 subscribers; for cascading with SMK 99xx Fx; as post amplifier or to terminate a cascadable system.

SAT IF:

- The SMS 9949 NFI provide improved maximum output level as well as an increased gain of the SAT IF trunk lines.
- Standby mode, even with cascaded sub devices SMK 99xx Fx, activation via trunk line.
- The multiswitch supports DiSEqC 2.0. That means a bidirectional communication between receiver and multiswitch is possible.
- Can be used with Quattro or QUAD LNBs.

Terrestrial:

- Return path compatible.
- Remote power over the terrestrial path for active cascade 18 V/150 mA.

Miscellaneous:

- The device is equipped with a switched-mode power supply.

Model Art. No.		SMS 9949 NFI 842431
EAN		4040326424315
Inputs/outputs SAT/terrestrial		9/9 8/1
Subscriber outputs		4
Tap loss terrestrial 5… 862 MHz		16…19 dB ± 1 dB
Tap gain SAT 950… 2200 MHz		0…4 dB ± 1 dB
Loss trunk lines terrestrial 5… 862 MHz		4…6 dB ± 1 dB
Gain trunk lines SAT IF 950…2200 MHz		15 dB ± 1 dB
Output level max. 950…2200 MHz 35 dB IMA_3/EN 60728 -3		typ. 116 dBµV
Selection	Terrestrial/SAT	typ. 35 dB
	SAT/terrestrial	typ. 35 dB
Isolation trunk/trunk		typ. 30 dB
Isolation receiver/receiver		typ. 35 dB
Mains power supply U~		100-240 V / 47-63 Hz
Power consumption incl. LNBs		max. 24 W
Power consumption standby		max. 2 W
LNB-total remote current		max. 500 mA
LNB-single remote current		max. 250 mA
Current consumption from receiver		25 mA
Ambient temperature		-20…+50 °C
Dimensions (mm)		340 x 130 x 56

Cascadable Multiswitch 9 in 8, 12, 16

SMK 9989 F, SMK 99129 F,
SMK 99169 F,
SMK 9989 FA, SMK 99129 FA,
SMK 99169 FA

For 8, 12 or 16 subscribers.

SAT IF:

- SAT IF signals amplified.
- The active cascades have a DC jack for remote power, if the launch amplifier does not provide remote power voltage.
- LED operation display.

Terrestrial:

- Terrestrial (85 … 862 MHz) signals amplified.
- Return path (5 … 65 MHz) passive.
- The supply of the active terrestrial path is possible via trunk line 0 (18 V / 90 mA), from the launch amplifier or the optional wall power supply (SNG 18/1000).

DiSEqC 2.0

! Only usable in combination with Launch Amplifiers **SMS 9949 NFI**, launch amplifiers **SMS 9982 NFI** or **SBK 99x5 NF**.

Model Art. No.	SMK 9989 F 842383	SMK 99129 F 842409	SMK 99169 F 842410	SMK 9989 FA 842510	SMK 99129 FA 842512	SMK 99169 FA 842514
EAN	4040326423837	4040326424094	4040326424100	4040326425107	4040326425121	4040326425145
Inputs / outputs SAT / terrestrial	9/9 8/1					
Subscriber outputs	8	12	16	8	12	16
Through loss terrestrial	typ. 4,5 dB	typ. 5 dB	typ. 5 dB	typ. 4,5 dB	typ. 5 dB	typ. 5 dB
Through loss SAT	typ. 2 ... 4 dB	typ. 3 ... 6 dB	typ. 3 ... 6 dB	typ. 2 ... 4 dB	typ. 3 ... 6 dB	typ. 3 ... 6 dB
Tap loss terrestrial 5 ... 65 MHz	20 dB ± 1 dB	22 dB ± 1 dB	24 dB ± 1 dB	20 dB ± 1 dB	22 dB ± 1 dB	24 dB ± 1 dB
Tap loss terrestrial 85 ... 862 MHz	22 dB ± 1 dB	22 dB ± 1 dB	24 dB ± 1 dB	3 ... 5 dB ± 1 dB	4 ... 3 dB ± 1 dB	5 ... 6 dB ± 1 dB
Tap gain SAT 950 ... 2200 MHz	-19 ... -17 dB ± 1 dB	-21 ... -18 dB ± 1 dB	-20 ... -16 dB ± 1 dB	2 ... 7 dB ± 1 dB	0 ... 4 dB ± 1 dB	0 ... 5 dB ± 1 dB
Output level max. terrestrial 85 ... 862 MHz 60 dB IMA_3 / EN 60728-3	-	-	-	typ. 92 dBµV	typ. 90 dBµV	typ. 88 dBµV
Output level max. SAT 950 ... 2200 MHz 35 dB IMA_3 / EN 60728-3	-	-	-	typ. 110 dBµV	typ. 110 dBµV	typ. 110 dBµV
Switching isolation	typ. 30 dB					
Isolation trunk / trunk	typ. 30 dB					
Isolation receiver / receiver	typ. 30 dB					
DC pass through trunk line 0; 2; 3 and 4	max. 20 V / 1 A					
Current consumption for each receiver max.	25 mA			75 mA		
Ambient temperature	-20 ... +50 °C					
Dimensions (mm	265 x 130 x 40	265 x 211 x 40	265 x 211 x 40	265 x 130 x 40	265 x 211 x 40	265 x 211 x 40

dSCR Multiswitch 5 in 32

SUS 32 W

Cascadable dSCR multiswitch for the distribution of 4 SAT IF signals (quattro LNB) or eight SAT IF signals (Wideband LNB's) and DVB-T signals over one cable to up to 32 receivers.

- **Configuration only with programmer SUS 32 COM (not in scope of delivery):**
  1 x dSCR (32 user bands) + 1 LEGACY output
  2 x dSCR outputs (16+16, 24+8,… user bands)
  Static mode as IF into IF conversion
- Programming via coaxial input
- DC input for power supply
- Passive terrestrial TV path
- Power supply not included in scope of delivery.

Model Art. No.	SUS 32 W 865124
EAN	4040326651249
Frequency range SAT input SAT output Terrestrial	 290 ... 2350 MHz 950 ... 2150 MHz 5 ... 862 MHz
Inputs SAT / terrestrial	5 4 / 1
Number of tap outputs	2
SAT input level	60 ... 95 dBµV
Through loss SAT 290 ... 2350 MHz Terrestrial 5 ... 862 MHz	 typ. 3 dB typ. 4 dB
SAT SCR output level AGC controlled	typ. 84 dBµV configurable
User bands / bandwidth	max. 32 configurable / 20-60 MHz configurable
Through loss terrestrial	typ. 11 dB
SAT LEGACY output level AGC controlled (only with Quattro LNB)	typ. 78 dBµV
Operating voltage DC IN	20 V / 2 A
DC pass through Trunk lines	SAT IF 2 A max. 1 A max. through one line Terrestrial max. 250 mA
Current pass to H trunk lines	DC IN: 20 V / 1,78 A max. Tap outs: 20 V / 550 mA max.
Current consumption at 20 V without external DC feeding	from DC IN: 20 V / 220 mA max. from trunk lines: 20 V / 220 mA max. from STB: 13 V / 350 mA max.
Ambient temperature	-20 ... +50 °C
Dimensions (mm)	120 x 95 x 27

dSCR Multiswitch 5 in 32 and 5 in 2x32

SUS 32 FA
SUS 2x32 FA

Cascadable dSCR multiswitch for the distribution of 4 SAT IF signals (Quattro LNB) and DVB-T signals (active terrestrial) for up to 32 receivers on each output pair. SUS 32 FA has one output pair, SUS 2x32 FA has two output pairs.

- **Configuration only with programmer SUS 32 COM (not in scope of delivery)**
- Active terrestrial signal path
- DC input (F-connector) for power supply
- LED for operating voltage
- Power supply not included in scope of delivery.

Modell Art. Nr.	SUS 32 FA 865126	SUS 2x32 FA 865127
EAN	4040326651261	4040326651278
Frequency range SAT Terrestrial	950 ... 2150 MHz 47 ... 862 MHz	
Inputs SAT / terrestrial	5 4 / 1	
Number of tap outputs	2 (one pair)	4 (two pair)
Through loss SAT 950 ... 2150 MHz Terrestrial 47 ... 862 MHz	typ. 3 dB typ. 1 dB	
Input level SAT Terrestrial	60 ... 95 dBµV max. 96 dBµV (IMD_3 = 60 dB)	
Output level SAT SCR AGC controlled	typ. 84 dBµV configurable	
User Bands / bandwidth	max. 32 per pair output configurable / 20-60 MHz configurable	
Gain terrestrial	8 dB ± 1 dB	4 dB ± 1 dB
Output level terrestrial	max. 104 dBµV (IMD_3 = 60 dB)	max. 100 dBµV (IMD_3 = 60 dB)
Output level SAT LEGACY AGC controlled	typ. 78 dBµV	
Operating voltage DC IN	20 V / 2 A	
DC pass through Trunk lines	SAT IF 2 A max. 1 A max. through one line Terrestrial max. 250 mA	
Current pass drom DC input to H trunk lines (switchable)	20 V / 1,73 A max.	20 V / 1,49 A max.
Current consumption at 20 V without external DC feeding	20 V / 270 mA max.	20 V / 510 mA max.
Ambient temperature	-20 ... +50 °C	
Dimensions (mm)	135 x 135 x 30	

Programmer for the dSCR Single Cable Multiswitch

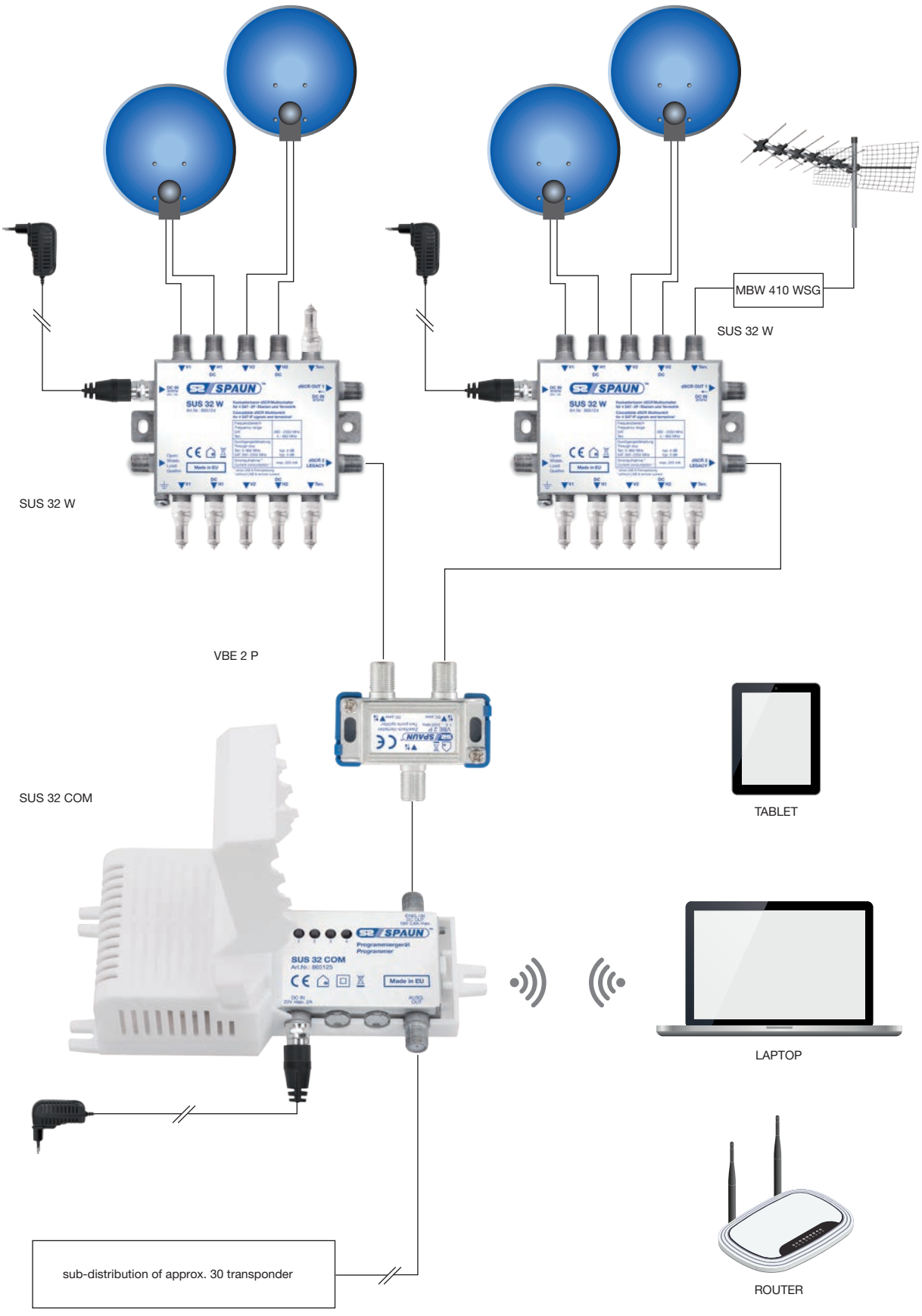
SUS 32 COM

The programmer SUS 32 COM is required for the configuration of the dSCR switch SUS 32 W, SUS 32 FA and SUS 2x32 FA. The internal memory of the SUS 32 COM offers the possibility to store up to 4 configurations, in order to transfer them to the dSCR multiswitch without a PC connection.

- Programmer for dSCR single cable multiswitch SUS 32 W, SUS 32 FA and SUS 2x32 FA
- Store and upload up to 4 different user selectable configurations.
- LED status indicator.
- Connection with the device through Wi-Fi (web interface).
- External power supply not in scope of delivery.

Model Art. No.	SUS 32 COM 865125
EAN	4040326651256
Frequency range	DC+22 kHz 47... 2400 MHz
RF through loss	typ. 1,5 dB
Multiswitch powering/control	14/18 V & 600 mA, EN 50494/EN 50607/ DiSEqC 2.0
Supply voltage	max. 18 - 20 V / 2 A
Power consumption	20 V 50 mA (without LNB)
Ambiente temperatur	0...+50 °C
Dimensions (mm)	175 x 75 x 50

Application sample 4 SAT positions IF into IF conversion



UNiSEqC SCR Multiswitch 4 in 1 x 4 according to EN 50494 + EN 50607

Model Art. No.	SUS 41 F 865099	SUS 41 FI 865098
EAN	4040326650998	4040326650981
Inputs	4	4
SAT input level	65 ... 95 dBµV	65 ... 95 dBµV
Tap loss terrestrial 5 ... 862 MHz	2 dB ± 1 dB	2 dB ± 1 dB
SAT output level	typ. 85 dBµV	typ. 85 dBµV
SCR - frequencies	1076 / 1178 MHz 1280 / 1382 MHz	1210 / 1420 MHz 1680 / 2040 MHz
Current consumption	260 mA + LNB	260 mA + LNB
LNB - remote current	max. 450 mA	
Ambient temperature	-20 ... +50 °C	-20 ... +50 °C
Dimensions (mm)	113 x 110 x 37	113 x 110 x 37

Optional:
Universal AC Adapter
SNG 18/1000 (Art. No.: 832114)

LED	Meaning
Green	Remote voltage 13 V
Green flashing	Valid command being executed
Red	Short circuit
Red flashing	Remote voltage 5 ... 10 V
Orange	Remote voltage > 15 V
Orange flashing	Band

SUS 41 F
SUS 41 FI with SCR addresses for Sky Italia (1210/1420/1680/2040 MHz)

SUS 41 F(I) devices allow the connection of up to 4 receivers or 2 dual tuner receivers (PVR) via one coaxial line. In this case, the SUS 41 F(I) uses the 4 subscriber outputs of the multiswitch or a QUAD - LNBs, which provide the SUS 41 F(I) an input signal. A coaxial cable may then be used to feed to 4 separate receivers or 2 PVRs (dual tuner) receivers. In any case, the receivers that are used must support the single cable protocol as per EN 50494 or EN 50607.
The SUS 41 F(I) is remote powered via the receiver, however it may also be supplied via an optional available wall mount power supply SNG 18/1000 (max. 18 V / 1000 mA) as required. In case of a direct connection to an LNB, the power supply SNG 18/1000 unit must be used.

SAT IF:

- SCR multiswitch for the distribution of up to 256 SAT IF signals and terrestrial (EN 50607).
- The SAT IF level is selected via the receiver with the SCR command according to EN 50494 or EN 50607.
- The unlimited program service of the connected satellites may be transmitted.
- Subscriber outputs are AGC controlled.
- Multipurpose LED status notification.
- F connector for optional wall power supply (SNG 18/1000, Art.Nr.: 832114).
- Due to a grid spacing of 20 mm at the input sockets, the SUS 41 F(I) may be mounted directly with many SPAUN multiswitches/cascades (4 push on F couplers are included in the scope of delivery).

Terrestrial:

- The terrestrial signal (FM, DVB - T, broadband cable) are looped through.
- Reception of terrestrial signals is also possible if the SAT receiver is switched off.

UNiSEqC SCR Multiswitch 2 in 1 x 2 according to EN 50494 + EN 50607

Optional:
Universal AC Adapter
SNG 18/1000 (Art. No.: 832114)

Model Art. No.	SUS 21 FX 865122	SUS 21 FXI 865123
EAN	4040326651223	4040326651230
Inputs	2	2
SAT input level	65...95 dBµV	65...95 dBµV
Tap loss terrestrial 5...862 MHz	2 dB ± 1 dB	2 dB ± 1 dB
SAT output level	typ. 75 dBµV	typ. 75 dBµV
SCR - frequencies	1076 / 1178 MHz	1210 / 1420 MHz
Current consumption	130 mA + LNB	130 mA + LNB
LNB-remote current	max. 450 mA	
Ambient temperature	-20...+50 °C	-20...+50 °C
Dimensions (mm)	39 x 107 x 30	39 x 107 x 30

LED	Meaning
Green	Remote voltage 13 V
Green flashing	Valid command being executed
Red	Short circuit
Red flashing	Remote voltage 5...10 V
Orange	Remote voltage > 15 V
Orange flashing	Band

SUS 21 FX
SUS 21 FXI with SCR addresses for Sky Italia (1210/1420 MHz)

SUS 21 FX(I) devices allow the connection of up to 2 receivers or 1 dual tuner receiver (PVR) via one coaxial line. In this case, the SUS 21 FX(I) uses the 2 subscriber outputs of the multiswitch or a TWIN - LNB, which provide the SUS 21 FX(I) an input signal. A coaxial cable may then be used to feed to 2 separate receivers or 1 PVR (dual tuner) receiver. In any case, the receivers that are used must support the single cable protocol as per EN 50494 or EN 50607.
The SUS 21 FX(I) is remote powered via the receiver, however it may also be supplied via an optional available wall mount power supply SNG 18/1000 (max. 18 V / 1000 mA) as required. In case of a direct connection to an LNB, the power unit SNG 18/1000 must be used.

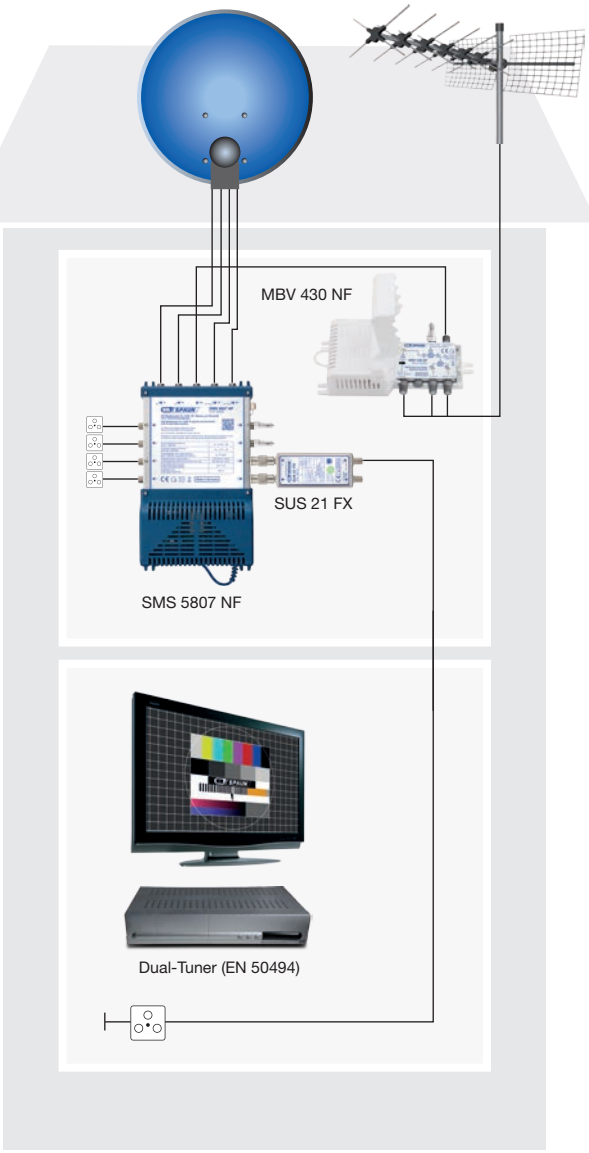
SAT IF:

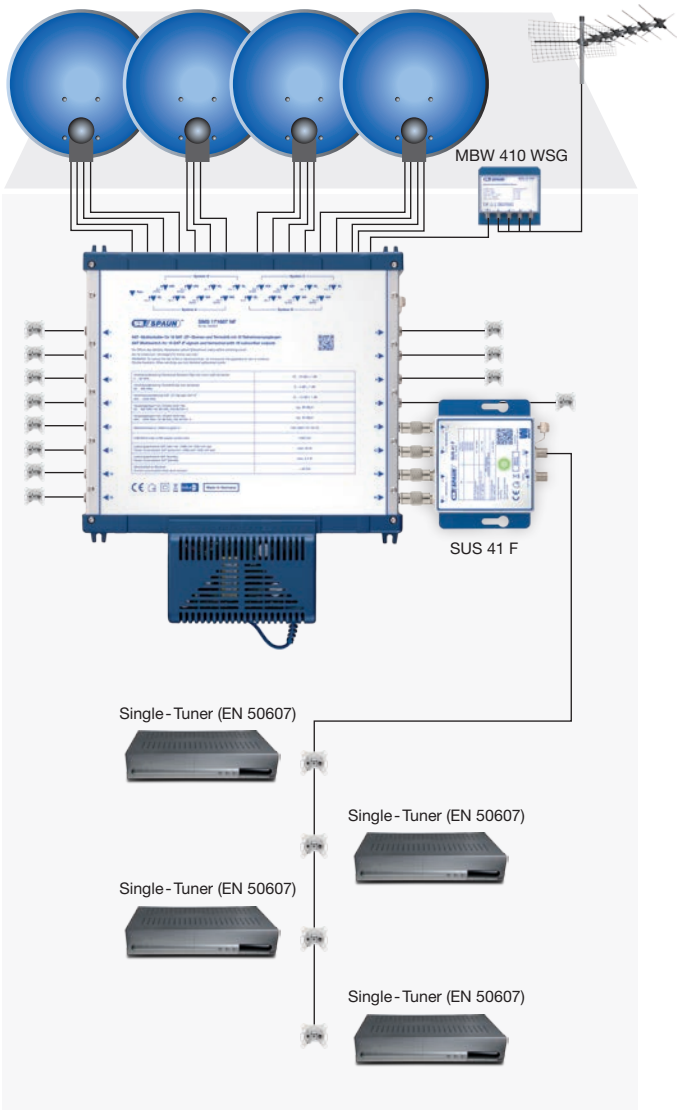
- SCR multiswitch for the distribution of up to 256 SAT IF signals and terrestrial (EN50607).
- The SAT IF level is selected via the receiver with the SCR command set as per EN 50494 or EN 50607.
- The unlimited program service of the connected satellites may be transmitted.
- Subscriber outputs are AGC controlled.
- Multipurpose LED status notification.
- F connector for optional wall power supply (SNG 18/1000, Art.Nr.: 832114).
- Due to a grid spacing of 20 mm at the input sockets, the SUS 21 FX(I) may be mounted directly with many SPAUN multiswitches/cascades (2 push on F couplers are included in the scope of delivery).

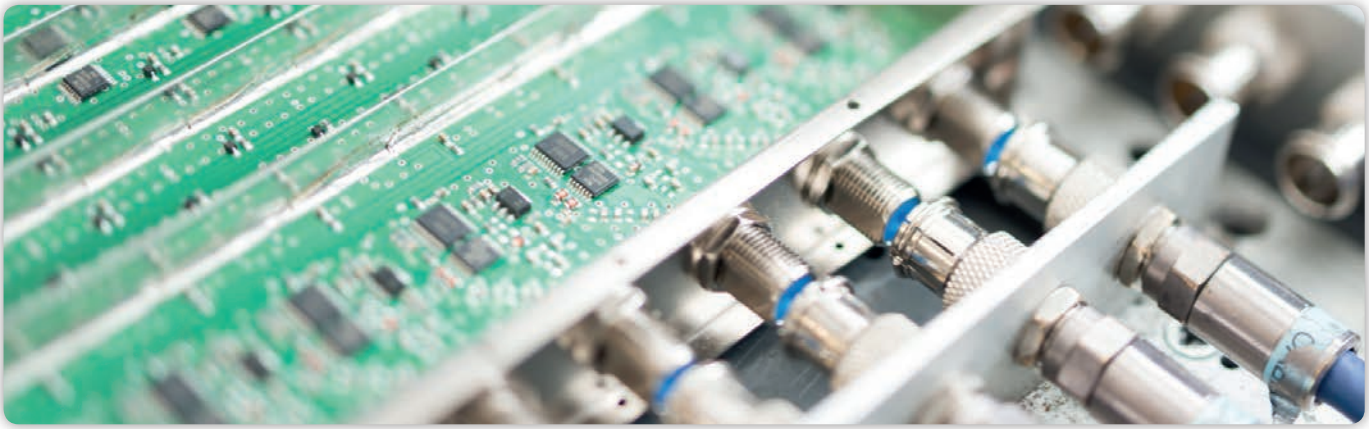
Terrestrial:

- The terrestrial signal (FM, DVB - T, broadband cable) are looped through.
- Reception of terrestrial signals is also possible if the SAT receiver is switched off.

Application samples







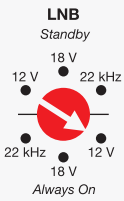
SPAROS 800, 808 and 888 Touch

(page 102)

- 10" touch screen.
- HEVC H.265 decoding.
- DiSEqC and SCR (EN 50494 & EN 50607) support.
- Powerful lithium-ion battery with a duration of up to 4 hours.
- Supplied in a metal transport case.

Compact Multiswitch with active terrestrial, 5 in 6, 8, 12, 16 and 24

LNB supply voltage



Selectable for
Quattro- & QUAD-LNB
12 V = Quattro-LNB,
22 kHz = QUAD-LNB

Standby- or
Always on-mode
for SAT-reception possible

Level adjuster terrestrial

Synchronous level adjuster

For Low- and High-Band

SMS 5606 NF, SMS 5806 NF
SMS 51206 NF, SMS 51606 NF, SMS 52406 NF

For 6, 8, 12, 16 or 24 subscribers.

SAT IF:

- The SAT IF amplifiers provide high output levels.
- Synchronous level adjuster for Low- and High-Band (0…-12dB).
- The multiswitch supports standby mode. Both the SAT IF amplifier, as well as the remote power supply of the LNB is only active if at least one receiver provides a supply voltage to the multiswitch outlet.
- LNB supply voltage selectable for Quattro or QUAD LNB.

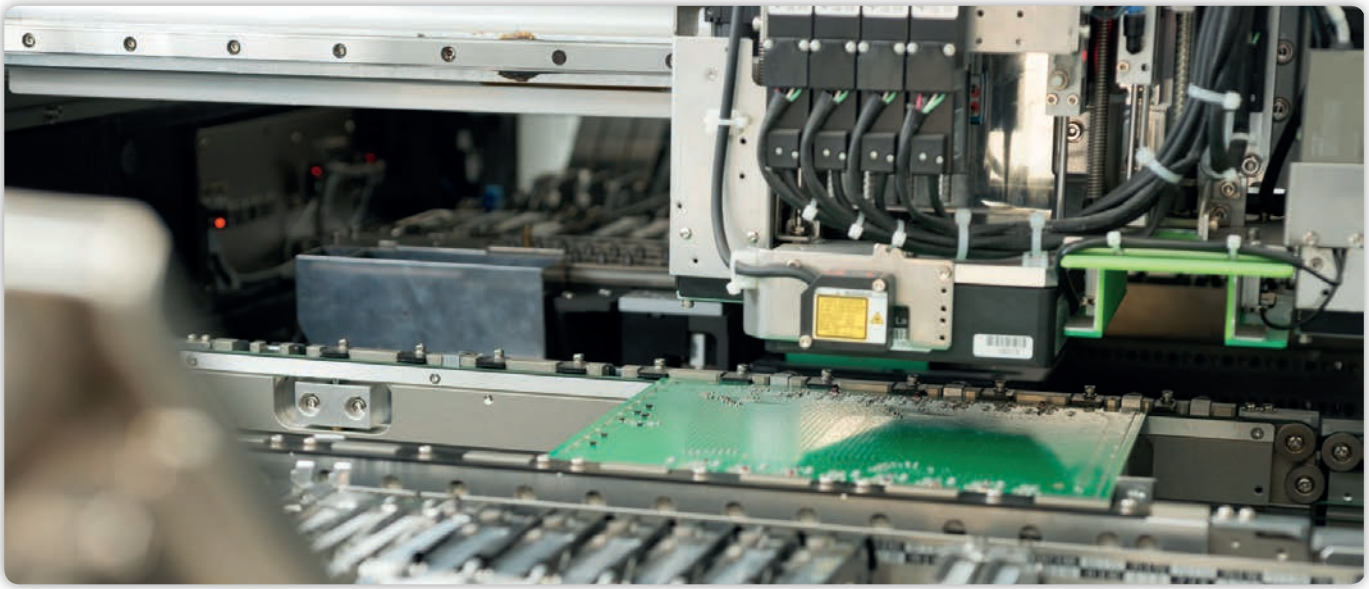
Terrestrial:

- The multiswitches have a passive return path for interactive applications (triple play) and additionally offer a CATV - compatible forward path.
- Level adjuster (0…-12 dB) for the terrestrial forward path.

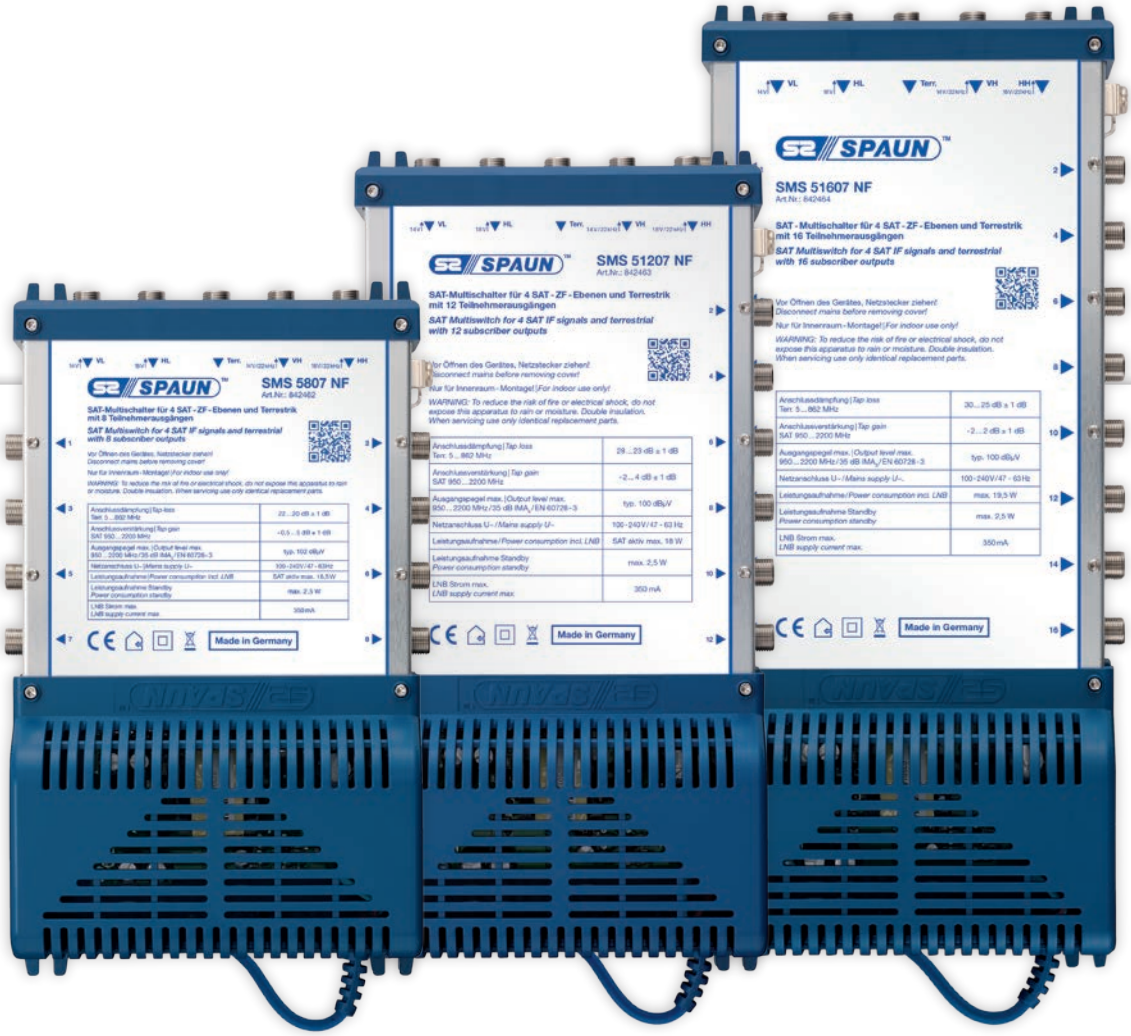
Miscellaneous:

- The devices are equipped with a switched-mode power supply.

Model Art. No.		SMS 5606 NF 816000	SMS 5806 NF 816001	SMS 51206 NF 816002	SMS 51606 NF 816003	SMS 52406 NF 816004
EAN		4040326160008	4040326160015	4040326160022	4040326160039	4040326160046
Inputs SAT/terrestrial		5 4/1				
Subscriber outputs		6	8	12	16	24
Tap loss Terr. passive 5…65 MHz		16…18 dB ± 1 dB	16…18 dB ± 1 dB	19…20 dB ± 1 dB	21…22 dB ± 1 dB	24…25 dB ± 1 dB
Tap gain Terr. active 85…862 MHz		10…12 dB ± 1 dB	10…12 dB ± 1 dB	9…10 dB ± 1 dB	6…8 dB ± 1 dB	4…7 dB ± 1 dB
Tap gain SAT IF 950…2200 MHz		7…14 dB ± 1 dB	5,5…12 dB ± 1 dB	4…10 dB ± 1 dB	4…9 dB ± 1 dB	0…6 dB ± 1 dB
Output level max. 85…862 MHz 60 dB IMA_3/EN 60728-3		typ. 93 dBµV	typ. 93 dBµV	typ. 90 dBµV	typ. 88 dBµV	typ. 84 dBµV
Output level max. 950…2200 MHz 35 dB IMA_3/EN 60728 -3		typ. 108 dBµV	typ. 108 dBµV	typ. 106 dBµV	typ. 105 dBµV	typ. 102 dBµV
Selection	SAT/terrestrial	typ. 45 dB				
	Terrestrial/SAT	typ. 40 dB				
Rejection	Switching isolation	typ. 35 dB				
	Receiver/receiver	typ. 36 dB/VHF, typ. 32 dB/UHF, typ. 35 dB/SAT				
Mains power supply U~		100-240 V / 47-63 Hz				
Power consumption terrestrial active/SAT active incl. LNB load with 350 mA		max. 19,5 W				
Power consumption SAT standby		max. 6 W				
LNB-total remote current		max. 350 mA				
Current consumption from each receiver		55 mA				
Ambient temperature		-20…+50 °C				
Dimensions (mm)		240 x 130 x 56	260 x 130 x 56	300 x 130 x 56	340 x 130 x 56	420 x 130 x 56



Compact Multiswitch 5 in 8, 12, 16



SMS 5807 NF, SMS 51207 NF, SMS 51607 NF

For 8, 12, or 16 subscribers.

SAT IF:

- LNB supply voltage for Quattro and QUAD LNB.
- The multiswitches support standby mode. Both the SAT IF amplifier, as well as the remote power supply of the LNB is only active if at least one receiver provides a supply voltage to the multiswitch outlet.

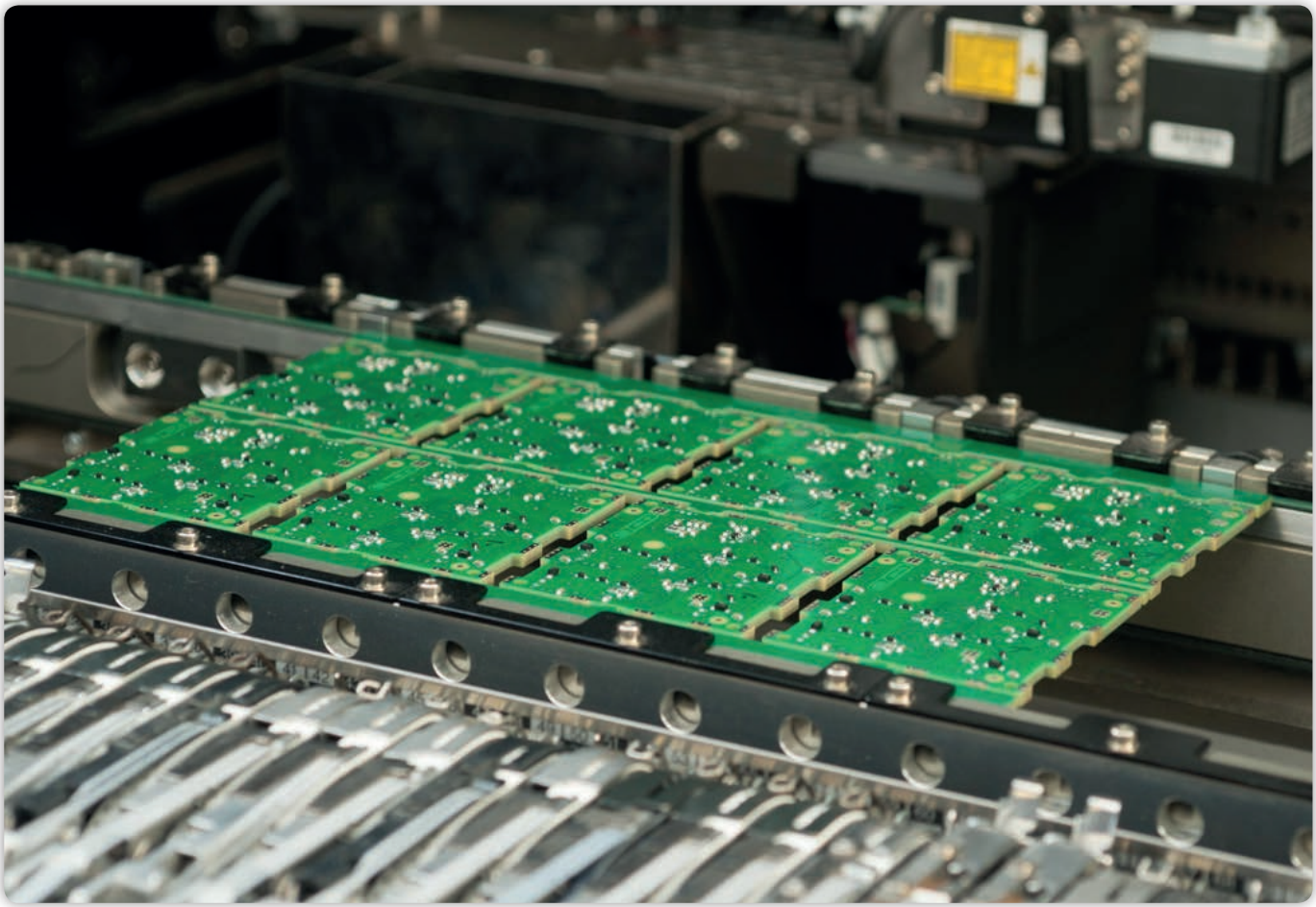
Terrestrial:

- Passive terrestrial path in the frequency range of 5 … 862 MHz (Triple Play).

Miscellaneous:

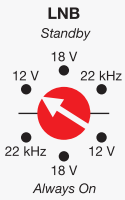
- The devices are equipped with a switched-mode power supply.

Model Art. No.	SMS 5807 NF 842462	SMS 51207 NF 842463	SMS 51607 NF 842464
EAN	4040326424629	4040326424636	4040326424643
Subscriber outputs	8	12	16
Inputs SAT/terrestrial	5 4/1		
Tap loss terrestrial 5 … 862 MHz	22 … 20 dB ± 1 dB	28 … 23 dB ± 1 dB	30 … 25 dB ± 1 dB
Tap gain SAT IF 950 … 2200 MHz	-0,5 … 5 dB ± 1 dB	-2 … 4 dB ± 1 dB	-2 … 2 dB ± 1 dB
Output level max. 950 … 2200 MHz 35 dB IMA_3/EN 60728-3	typ. 102 dBµV	typ. 100 dBµV	typ. 100 dBµV
Isolation receiver/receiver terrestrial/SAT	typ. 26 dB		
Mains supply U~	100-240 V / 47-63 Hz		
Power consumption incl. LNB load with 350 mA	max. 16,5 W	max. 18 W	max. 19,5 W
Power consumption standby	max. 2,5 W		
LNB-total remote current	max. 350 mA		
Current consumption from each receiver	10 mA		
Ambient temperature	-20 … +50 °C		
Dimensions (mm)	220 x 132 x 56	260 x 132 x 56	300 x 132 x 56



Launch Amplifier for large distribution networks / 5 inputs

LNB supply voltage



Switch for Quattro or QUAD LNB.

Standby or normal operation mode selectable for SAT reception.

Synchronous level adjuster

For each Low- and High-Band to adjust different input levels.

Only SBK 5502 NF / -8 dB and SBK 5503 NFI / -10 dB.

SBK 5501 NFI, SBK 5502 NF, SBK 5503 NFI

5 DC-decoupled terminating resistors are shipped with the SBK 55xx NFx to terminate the trunk lines.
ZFR 75 DC /Set (Art.No.: 871511)

SAT IF:

- Amplifiers have precompensating slope

SBK 5501 NFI:
- Passive return path compatible terrestrial.
- 12 V / 200 mA remote power for the active cascades (SMK 55xx3 FA).
- Only usable for Quattro LNB.

SBK 5502 NF:
- Integrated level adjuster (0 … -8 dB) switchable to passive mode (5 … 862 MHz).
- LNB supply voltage selectable for the use of Quattro or QUAD LNB.

SBK 5503 NFI:
- Passive return path 5 … 65 MHz.
- CATV compatible forward path.
- Integrated level adjuster (0 … -10 dB).
- LNB supply voltage selectable for the use of Quattro or QUAD LNB.

Miscellaneous:

- The devices are equipped with a switched-mode power supply.

Remote supply for one post amplifier (except SBK 5501 NFI):
- SBK 5502 NF 18 V / 650 mA
- SBK 5503 NFI 18 V / 1000 mA

Model Art. No.		SBK 5502 NF 842389	SBK 5503 NFI 842488	SBK 5501 NFI 842437
EAN		4040326423899	4040326424889	4040326424377
Inputs/outputs SAT/terrestrial		5/5 4/1		
Loss Terr. passive 5…862 MHz		3,5 dB	-	2 dB
Loss Terr. passive 5…65 MHz		-	4 dB	-
Gain Terr. active 47…862 MHz		22 dB	-	-
Gain Terr. active 85…862 MHz		-	27…32 dB	-
Gain SAT IF 950…2200 MHz		19…25 dB	25…32 dB	21…26 dB
Output level max. 47…862 MHz 60 dB IMA_3/EN 60728-3		109 dBµV	118 dBµV	-
Output level max. 950…2200 MHz 35 dB IMA_3/EN 60728-3		110 dBµV	118 dBµV	110 dBµV
Rejection	Terrestrial active/SAT	typ. 30 dB	typ. 50 dB	-
	Terrestrial passive/SAT	typ. 30 dB	-	typ. 22 dB
	SAT/terrestrial	typ. 35 dB	typ. 55 dB	typ. 50 dB
Isolation trunk /trunk		typ. 30 dB		typ. 26 dB
Mains power supply U~		100-240 V / 47-63 Hz		
Power consumption Terr. active/SAT active incl. LNB load with		max. 40 W 350 mA	max. 50 W 350 mA	-
Power consumption Terr. passive/SAT active incl. LNB load with		max. 23 W 350 mA	-	max. 11 W 350 mA
Power consumption Terrestrial active/SAT standby		max. 22 W	max. 12 W	-
Power consumption Terrestrial passive/SAT standby		max. 8,5 W	-	max. 2 W
LNB-single remote current		350 mA	350 mA	12V/350 mA
Current for post amplifier		max. 18 V / 650 mA	max. 18 V / 1 A	-
Ambient temperature		-20…+50 °C		
Dimensions (mm)		220 x 130 x 52	300 x 130 x 52	195 x 90 x 52

Tech hint

For connections between SBK 5501 NFI/SBK 5502 NF and cascadable multiswitches you can use **ZSV 10/Set, Art. No. 871538** and for connections between SBK 5503 NFI and cascadable multiswitches you can use patch cables.

Post Amplifier for cascadable distribution systems

Synchronous level adjuster

For all SAT IF amplifier.

With the integrated variable level adjuster active or passive distribution can be selected.

Tech hint

When planning, please take into consideration that the post amplifier NVF 5522 SR can only be supplied by the launch amplifiers SBK 5502 NF or SBK 5503 NFI.

NVF 5522 SR

SAT IF:

- SAT IF amplifier with precompensating slope.
- Synchronous level adjuster for all SAT IF amplifiers.

Terrestrial:

- Terrestrial amplifier for CATV.
- With the integrated level adjuster active or passive distribution can be selected.
- Integrated level adjuster (0…-10 dB).
- With max. attenuation the amplifier is turned off and the terrestrial path is return path compatible (5…862 MHz).

Model Art. No.		NVF 5522 SR 814219
EAN		4040326142196
Inputs/outputs SAT/terrestrial		5/5 4/1
Loss Terrestrial passive 5 … 862 MHz		typ. 4 dB
Gain Terrestrial active 47 … 862 MHz		22 dB ± 1 dB
Gain SAT IF 950 … 2200 MHz		15 … 18 dB ± 1 dB
Output level max. 47 … 862 MHz 60 dB IMA_3/EN 60728-3		typ. 108 dBµV
Output level max. 950 … 2200 MHz 35 dB IMA_3/EN 60728-3		typ. 110 dBµV
Rejection	Terrestrial active/SAT	typ. 22 dB
	Terrestrial passive/SAT	typ. 20 dB
	Terrestrial/SAT	typ. 30 dB
Isolation trunk /trunk		typ. 26 dB
Current per trunk line 0; 2; 3 and 4		max. 20 V / 1 A
Ambient temperature		-20 … +50 °C
Dimensions (mm)		145 x 130 x 39

Cascadable Multiswitch (passive) 5 in 8, 12, 16, 24

SMK 5583 F, SMK 55123 F
SMK 55163 F, SMK 55243 F

For 8, 12, 16 or 24 subscribers.

SAT IF:

- The SAT IF polarity selection is controlled by remote voltage, < 14 V ≅ Vert. / > 16 V ≅ Hor. and the 22 kHz tone provided by the receiver.
- Standby control on trunk line 1.

Terrestrial:

- Return path compatible.

! Only usable in combination with launch amplifier **SBK 55xx NFx.**

Model Art. No.	SMK 5583 F 842491	SMK 55123 F 842492	SMK 55163 F 842493	SMK 55243 F 842494
EAN	4040326424919	4040326424926	4040326424933	4040326424940
Inputs/outputs SAT/terrestrial	5/5 4/1			
Subscriber outputs	8	12	16	24
Through loss terrestrial	typ. 5 dB	typ. 5 dB	typ. 5 dB	typ. 5 dB
Through loss SAT	typ. 1,5 ... 2,5 dB	typ. 1 ... 4 dB	typ. 2 ... 6 dB	typ. 2 ... 7 dB
Tap loss terrestrial	20 dB ± 1 dB	25 ... 23 dB ± 1 dB	24 ... 25 dB ± 1 dB	29 ... 27 dB ± 1 dB
Tap loss SAT	21 ... 18 dB ± 1 dB	20 ... 18 dB ± 1 dB	20 ... 17 dB ± 1 dB	22 ... 19 dB ± 1 dB
Switching isolation	typ. 30 dB			
Isolation trunk / trunk	typ. 30 dB			
Isolation receiver / receiver	typ. 30 dB			
Current per trunk line 0; 2; 3 and 4	max. 20 V / 1 A			
Current consumption for each receiver max.	20 mA			
Ambient temperature	-20 ... +50 °C			
Dimensions (mm)	145 x 130 x 40	185 x 130 x 40	225 x 130 x 40	305 x 130 x 40

Cascadable Multiswitch (active) 5 in 8, 12, 16, 24

Stand-alone capable

Optional:
Universal AC Adapter
SNG 18/1000 (Art. No.: 832114)
Wall power supply
U~: 100…240/47-63 Hz

Maximum trunk line input level of the active cascade is 83…77 dBµV.

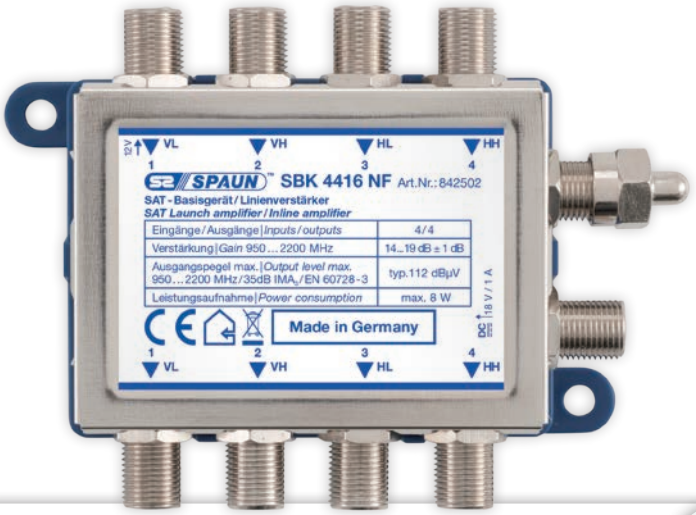
SMK 5583 FA, SMK 55123 FA
SMK 55163 FA, SMK 55243 FA

For 8, 12, 16 or 24 subscribers.

- SAT IF signals amplified.
- Terrestrial (85…862 MHz) signals amplified.
- Return path (5…65 MHz) passive.
- The SAT IF polarity selection is controlled by remote voltage, < 14 V ≅ Vert. / > 16 V ≅ Hor. and the 22 kHz tone provided by the receiver.
- The devices have a DC jack for remote power, if the launch amplifier would not provide remote power voltage.
- LED operation display.
- The supply of the active terrestrial is possible via trunk line 0 (18 V / 90 mA), from the launch amplifier or the optional wall power supply (SNG 18/1000).

Model Art. No.	SMK 5583 FA 842486	SMK 55123 FA 842418	SMK 55163 FA 842419	SMK 55243 FA 842487
EAN	4040326424865	4040326424186	4040326424193	4040326424872
Inputs/outputs SAT/terrestrial	5/5 4/1			
Subscribers outputs	8	12	16	24
Through loss terrestrial	typ. 5 dB	typ. 5 dB	typ. 4…5 dB	typ. 4…5 dB
Through loss SAT	typ. 1,5…2,5 dB	typ. 1,5…3,5 dB	typ. 2…5 dB	typ. 3…7,5 dB
Tap loss terrestrial 5…65 MHz	typ. 20 dB	typ. 24 dB	typ. 24 dB	typ. 28 dB
Tap loss terrestrial 85…862 MHz	4…3 dB ± 1 dB	9…6 dB ± 1 dB	7…5 dB ± 1 dB	11…9 dB ± 1 dB
Tap gain SAT 950…2200 MHz	0…6 dB ± 1 dB	1,5…5 dB ± 1 dB	1…6 dB ± 1 dB	1…4 dB ± 1 dB
Output level max. terrestrial 85…862 MHz 60 dB IMA_3/EN 60728-3	typ. 92 dBµV	typ. 90 dBµV	typ. 88 dBµV	typ. 86 dBµV
Output level max. SAT 950…2200 MHz 35 dB IMA_3/EN 60728-3	typ. 95 dBµV	typ. 95 dBµV	typ. 95 dBµV	typ. 95 dBµV
Switching isolation	typ. 30 dB			
Isolation trunk /trunk	typ. 30 dB			
Isolation receiver/receiver	typ. 30 dB			
DC pass through trunk line 0 to 4	max. 20 V / 1 A			
Current consumption for each receiver max.	75 mA			
Ambient temperature	-20…+50 °C			
Dimensions (mm)	145 x 130 x 40	185 x 130 x 40	225 x 130 x 40	305 x 130 x 40

Launch / Inline Amplifier with 4 SAT IF inputs



When the terminating resistor is plugged on the amplifier the device turns into inline amplifier mode (DC pass on all 4 trunk lines).

4 DC-decoupled terminating resistors are shipped with the SBK 4416 NF to terminate the trunk lines.
ZFR 75 DC / Set (Art.No.: 871511)

SBK 4416 NF

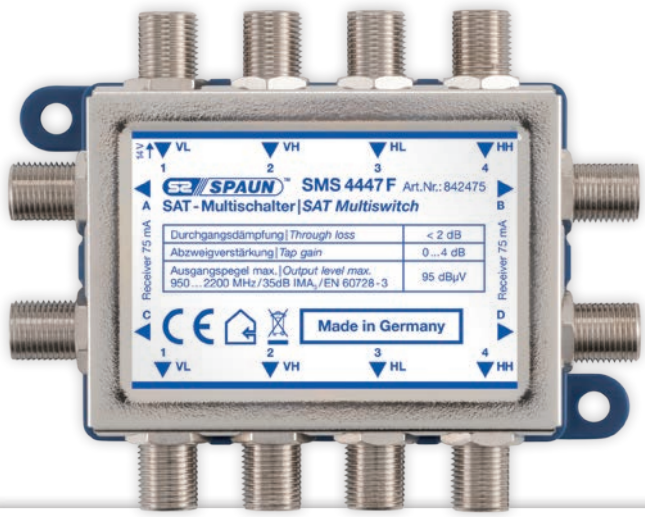
Launch Amplifier for SMS 4447 F and SMS 4487 F.

SAT IF:

- LNB supply voltage can be switched off (by using the included decoupled terminating resistor) to use the device as an inline amplifier.
- Power is supplied via the DC IN connection (F-socket) 18 V / 1 A.
- External power supply included in scope of delivery (SNG 18/1000).

Model Art. No.	SBK 4416 NF 842502
EAN	4040326425022
Inputs / outputs	4 / 4
Gain SAT 950 ... 2200 MHz	14 ... 19 dB ± 1 dB
Output level max. 950 ... 2200 MHz 35 dB IMA_3 / EN 60728-3	typ. 112 dBµV
Isolation trunk / trunk	typ. 35 dB
DC - pass through	max. 20 V / 1 A
Operating voltage DC IN (F-socket)	DC 18 V / 1000 mA
LNB remote power	12 V max. 300 mA
Power consumption incl. LNB	max. 8 W
Ambient temperature	-20 ... +50 °C
Dimensions (mm)	90 x 71 x 27

Cascadable Multiswitch / stand-alone Multiswitch 4 in 4, 8



SMS 4447 F
SMS 4487 F

For 4 and 8 subscribers.

SAT IF:

- Cascadable multiswitch.
- Also usable as receiver powered stand-alone device.
- For Quattro LNB only.

Model Art. No.	SMS 4447 F 842475	SMS 4487 F 842476
EAN	4040326424759	4040326424766
Inputs / outputs	4 / 4	4 / 8
Subscriber outputs	4	8
Through loss	typ. 2 dB	typ. 3 dB
Tap gain	0 ... 4 dB ± 1 dB	-1 ... 4 dB ± 1 dB
Output level max. 950 ... 2200 MHz 35 dB IMA_3 / EN 60728-3	typ. 95 dBµV	
Switching isolation	typ. 26 dB	
Isolation trunk / trunk receiver / receiver	 typ. 35 dB typ. 26 dB	
DC-pass through	max. 20 V / 1 A	
Current from receiver	75 mA	
Ambient temperature	-20 ... +50 °C	
Dimensions (mm)	90 x 71 x 27	90 x 113 x 27

Cascadable Multiswitch 2 in 12

SMS 2212 F

For 12 subscribers.

- Remote powered by satellite receiver.
- Cascadable multiswitch for distribution of 2 SAT IF signals for 12 subscribers.
- The IF polarity selection is controlled by the remote voltage, < 14 V ≅ Vert. / > 16 V ≅ Hor. provided by the receiver.

Model Art. No.	SMS 2212 F 842344
EAN	4040326423448
Inputs / outputs	2 / 2
Subscriber outputs	12
Through loss SAT IF 950 … 2200 MHz	0 dB
Tap loss SAT	0 dB
Output level max. 950 … 2150 MHz 35 dB IMA_3 / EN 60728 - 3	94 dBµV
Isolation receiver / receiver	typ. 23 dB
Isolation trunk / trunk	typ. 30 dB
Current consumption	75 mA
DC pass per trunk line	max. 20 V / 500 mA
Ambient temperature	-20 … +50 °C
Dimensions (mm)	205 x 90 x 40

Compact Multiswitch 2 in 8

SMS 287 F

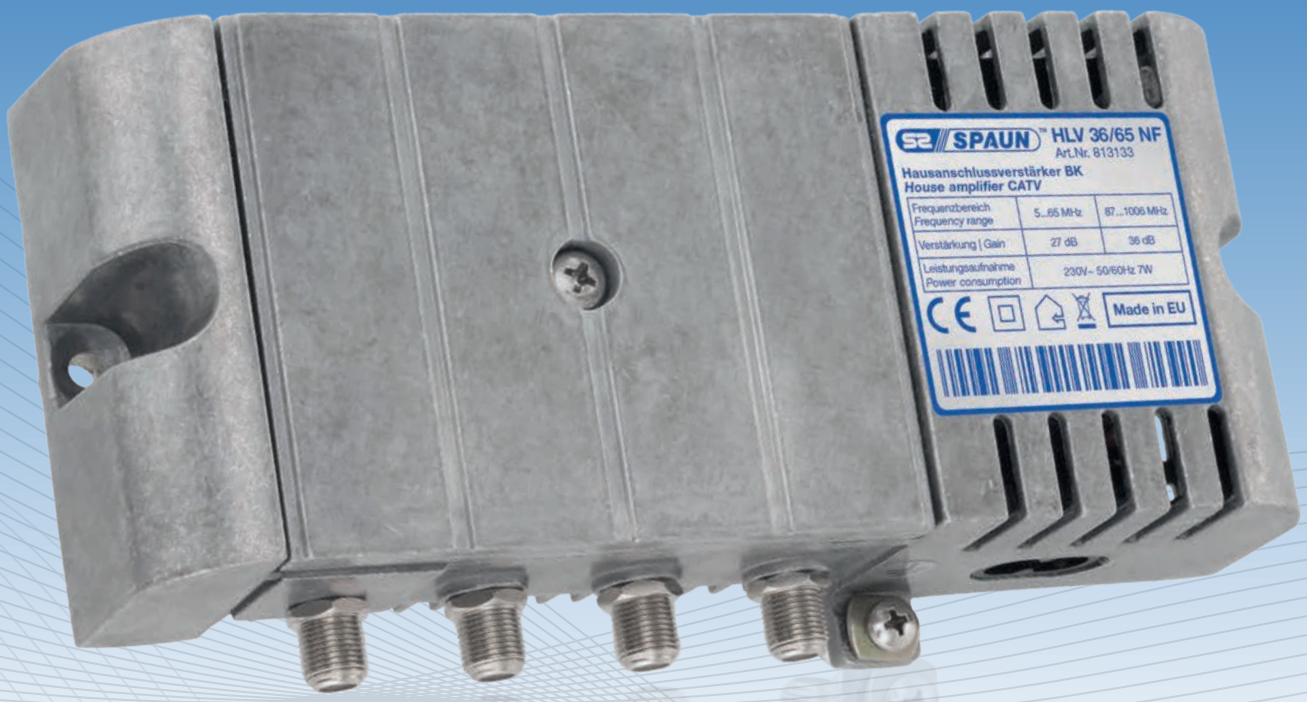
For 8 subscribers.

- Remote powered by satellite receiver.
- Compact multiswitch for distribution of 2 SAT IF signals for 8 subscribers.
- The IF polarity selection is controlled by the remote voltage, < 14 V ≅ Vert. / > 16 V ≅ Hor. provided by the receiver.

Model Art. No.	SMS 287 F 842497
EAN	4040326424971
Inputs	2
Subscriber outputs	8
Through gain SAT IF 950 … 2200 MHz	0 … 3,5 dB
Output level max. 950 … 2150 MHz 35 dB IMA_3 / EN 60728 - 3	98 dBµV
Isolation receiver / receiver	typ. 26 dB
Current consumption	-
Current consumption from each receiver	75 mA
Current (IF ports)	max. 20 V / 500 mA
Ambient temperature	-20 … +50 °C
Dimensions (mm)	140 x 90 x 40

CATV Amplifier

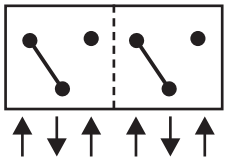
(page 91)

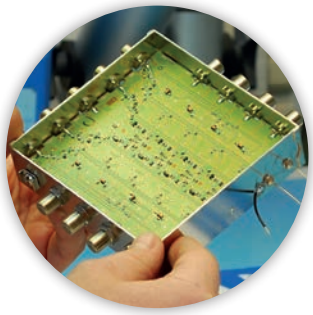


The new CATV Amplifiers

- **HLV 36/30 NF and HLV 36/65 NF**
  Frequency range up to 1006 MHz

SAT Antenna Relay





DiSEqC 2.0

SAR 422 WSG

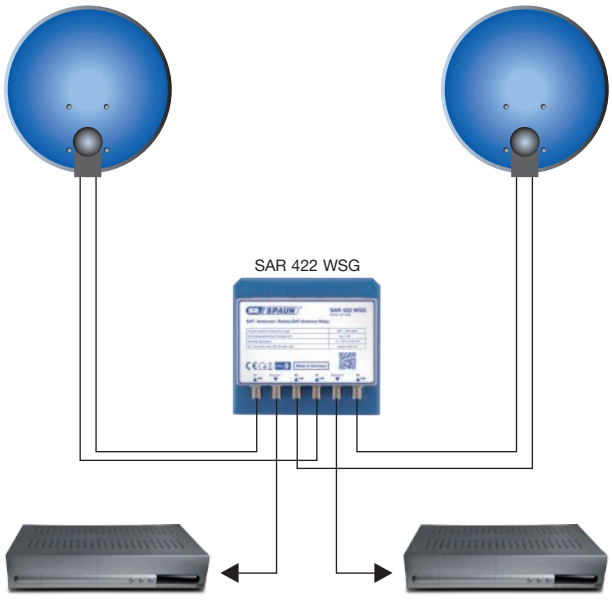
SAT IF:

- For 2 TWIN LNBs on 2 receivers.
- Feed-through of the 22 kHz tone and the DiSEqC command.
- The satellite system (east/west) is selected using the DiSEqC command „Position“ or the analogue Tone Burst.

Model Art. No.	SAR 422 WSG 871426
EAN	4040326714263
Inputs/outputs	4/2
Outdoor case	✓
Frequency range	950 … 2200 MHz
Through loss	max. 2 dB
Switching isolation	typ. 35 dB
Isolation relays/relays	typ. 30 dB
DC pass per trunk line	max. 20 V / 600 mA
System switching using DiSEqC-commands	Position
Current from receiver max.	2 x 25 mA
Ambient temperature	-20 … +50 °C
Dimensions (mm)	124 x 112 x 40

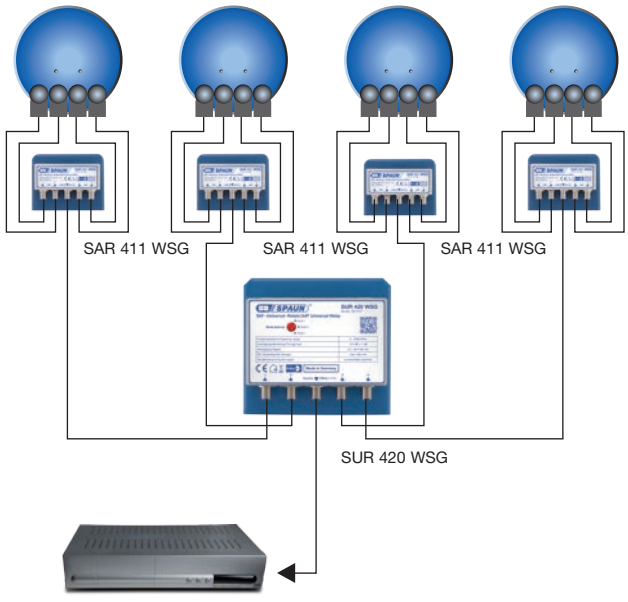
Application sample

SAR 422 WSG

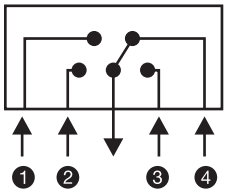


Application sample

SUR 420 WSG (page 71)



SAT Antenna Relay



Application sample

for SUR 420 WSG (refer to page 70)

DiSEqC 1.1/2.1 receiver required!

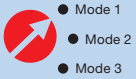
DiSEqC 2.1

SUR 420 WSG

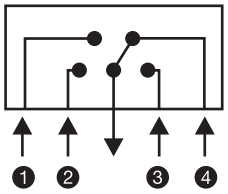
SAT IF:

- To be used as „Uncommitted Switch“.
- For individual reception systems.
- Feed-through of the 22 kHz tone and the DiSEqC command.
- To multiplex 4 down lead cables.
- Cascadable to up to 256 IF signals.

Model Art. No.	SUR 420 WSG 871417
EAN	4040326714171
Inputs/outputs	4/1
Outdoor case	✓
Frequency range	5…2200 MHz
Through loss	max. 2,5 dB
Switching isolation terrestrial	typ. 40 dB
Switching isolation SAT	typ. 26 dB
DC pass per trunk line	max. 20 V / 500 mA
System switching using DiSEqC-commands	Uncommitted
Current from receiver max.	30 mA
Ambient temperature	-20…+50 °C
Dimensions (mm)	124 x 112 x 40

MODE selector	SMATV	START Byte	ADDRESS Byte	COMMAND Byte	DATA Byte	Mode 1	Mode 2	Mode 3
	1	E0	18	39	F0	Input 1	Input 1	Input 1
	2	E0	18	39	F1	Input 2		
	3	E0	18	39	F2	Input 3	Input 2	
	4	E0	18	39	F3	Input 4		
	5	E0	18	39	F4	Input 1	Input 3	Input 2
	6	E0	18	39	F5	Input 2		
	7	E0	18	39	F6	Input 3	Input 4	
	8	E0	18	39	F7	Input 4		
	9	E0	18	39	F8	Input 1	Input 1	Input 3
	10	E0	18	39	F9	Input 2		
	11	E0	18	39	FA	Input 3	Input 2	
	12	E0	18	39	FB	Input 4		
	13	E0	18	39	FC	Input 1	Input 3	Input 4
	14	E0	18	39	FD	Input 2		
	15	E0	18	39	FE	Input 3	Input 4	
	16	E0	18	39	FF	Input 4		

SAT Antenna Relay



DiSEqC 2.0

SAR 411 WSG
SAR 212 WSG

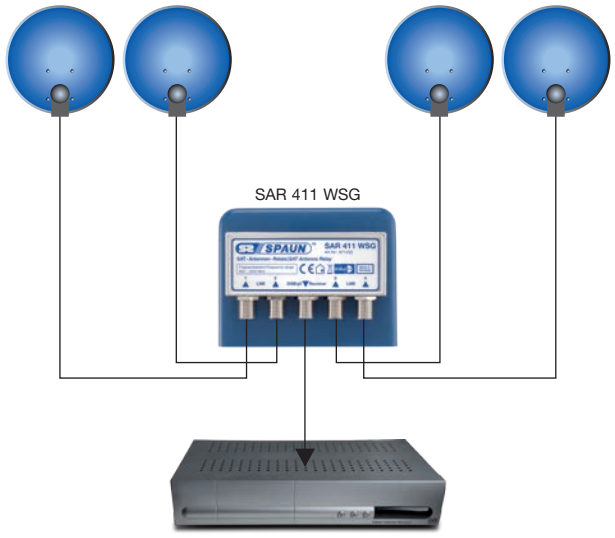
For 2 single SAT LNBs on 1 receiver
(SAR 212 WSG).

For 4 single SAT LNBs on 1 receiver
(SAR 411 WSG).

SAT IF:

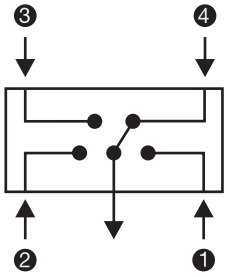
- Feed-through of the 22 kHz tone and the DiSEqC command.
- To multiplex 2 or 4 down lead cables.
- The satellite system (east/west) is selected using the DiSEqC command „Position“ or the analogue Tone Burst.

Application sample



Model Art. No.	SAR 411 WSG 871432	SAR 212 WSG 871430
EAN	4040326714324	4040326714300
Inputs/outputs	4/1	2/1
Outdoor case	✓	✓
Frequency range	950 … 2200 MHz	
Through loss max.	2 dB	1,5 dB
Switching isolation	typ. 26 dB	typ. 33 dB
DC pass per trunk line	max. 20 V / 500 mA	max. 20 V / 500 mA
System switching using DiSEqC-commands	Option, position	Position
Current from receiver max.	30 mA	20 mA
Ambient temperature	-20 … +50 °C	
Dimensions (mm)	94 x 73 x 26	64 x 73 x 26

SAT Antenna Relay



DiSEqC 2.0

SAR 411 FI
SAR 212 FI

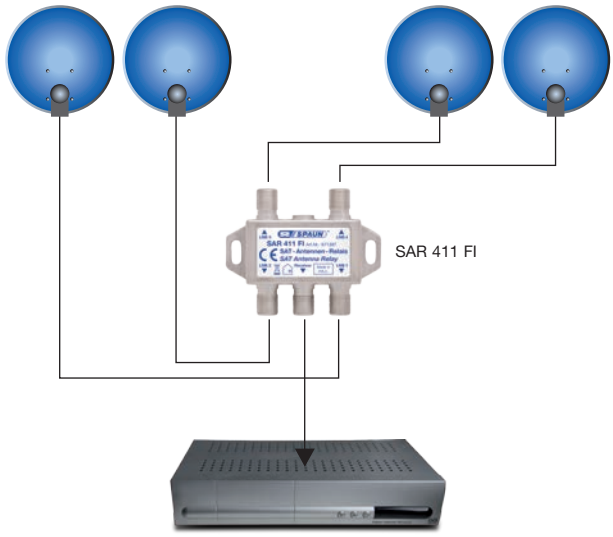
For 2 single SAT LNBs on 1 receiver
(SAR 212 FI).

For 4 single SAT LNBs on 1 receiver
(SAR 411 FI).

SAT IF:

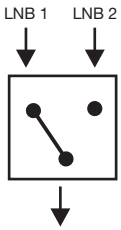
- Feed-through of the 22 kHz tone and the DiSEqC command.
- To multiplex 2 or 4 down lead cables.
- The satellite system (east/west) is selected using the DiSEqC command „Position“ or the analogue Tone Burst.

Application sample



Model Art. No.	SAR 411 FI 871397	SAR 212 FI 871398
EAN	4040326713976	4040326713983
Inputs/outputs	4/1	2/1
Outdoor case	✓	✓
Frequency range	950…2200 MHz	
Through loss	typ. 3 dB	typ. 2,5 dB
Switching isolation	typ. 30 dB	typ. 35 dB
DC pass per trunk line	max. 20 V / 500 mA	max. 20 V / 500 mA
System switching using DiSEqC-commands	Option, position	Position
Current from receiver max.	40 mA	40 mA
Ambient temperature	-20…+50 °C	
Dimensions (mm)	66 x 53 x 16	66 x 42 x 16

SAT Antenna Relay



Application sample

for SUR 211 WSG (refer to page 75)

SUR 211 WSG

SAT IF:

- Feed-through of the 22 kHz tone and the DiSEqC command.
- Mode selector offers 3 different operation modes:
  1. Position
  2. Option
  3. 1st Uncommitted switch

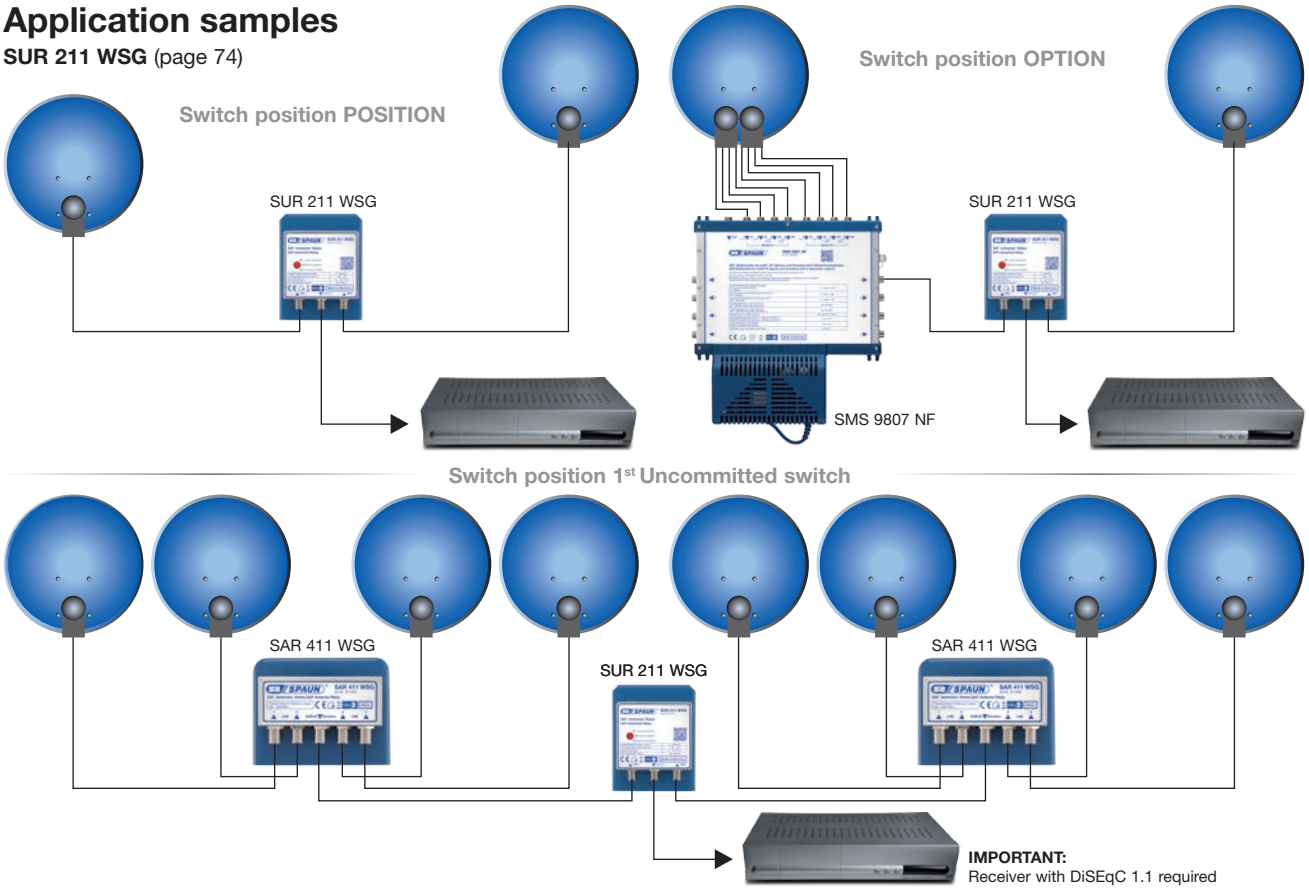
Model Art. No.	SUR 211 WSG 871437
EAN	4040326714379
Inputs/outputs	2/1
Outdoor case	✓
Frequency range	5…2200 MHz
Through loss max.	1 dB ± 1 dB
Switching isolation terrestrial	typ. 40 dB
Switching isolation SAT	typ. 26 dB
DC pass per trunk line	max. 20 V / 500 mA
System switching using DiSEqC-commands	1st Uncommitted, Option, position
Current from receiver max.	35 mA
Ambient temperature	-20…+50 °C
Dimensions (mm)	90 x 112 x 40

										Switch setting		
MODE Selector	SMATV	Option	Satellite Position System	Polarisation	Band	START Byte	ADDRESS Byte	COMMAND Byte	DATA Byte	1st Ucommitted	Position	Option
1st Uncommitted Switch / Position (Tone Burst) / Option (nur DiSEqC)	1	A	A	Vert.	Low	E0	00*/18**	38*/39**	F0	LNB 1	LNB 1	LNB 1
	2				High	E0	00*/18**	38*/39**	F1	LNB 2		
	3			Hor.	Low	E0	00*/18**	38*/39**	F2	LNB 1		
	4				High	E0	00*/18**	38*/39**	F3	LNB 2		
	5		B	Vert.	Low	E0	00*/18**	38*/39**	F4	LNB 1	LNB 2	
	6				High	E0	00*/18**	38*/39**	F5	LNB 2		
	7			Hor.	Low	E0	00*/18**	38*/39**	F6	LNB 1		
	8				High	E0	00*/18**	38*/39**	F7	LNB 2		
	9	B	C	Vert.	Low	E0	00*/18**	38*/39**	F8	LNB 1	LNB 1	LNB 2
	10				High	E0	00*/18**	38*/39**	F9	LNB 2		
	11			Hor.	Low	E0	00*/18**	38*/39**	FA	LNB 1		
	12				High	E0	00*/18**	38*/39**	FB	LNB 2		
	13		D	Vert.	Low	E0	00*/18**	38*/39**	FC	LNB1	LNB 2	
	14				High	E0	00*/18**	38*/39**	FD	LNB 2		
	15			Hor.	Low	E0	00*/18**	38*/39**	FE	LNB 1		
	16				High	E0	00*/18**	38*/39**	FF	LNB 2		

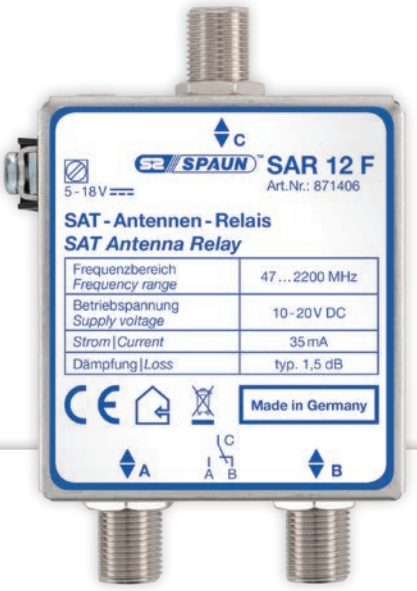
*Committed, **Uncommitted

Application samples

SUR 211 WSG (page 74)

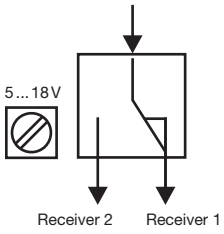


SAT Antenna Relay



SAR 12 F

To switch between 2 SAT IF systems.



External switching voltage is required to switch-over to receiver 2.

Model Art. No.	SAR 12 F 871406
EAN	4040326714065
Inputs/outputs	1/2
Frequency range	47...2200 MHz
Through loss	0,8 dB
Switching isolation terrestrial	typ. 40 dB
Switching isolation SAT	typ. 25 dB
DC pass per trunk line	max. 20 V / 500 mA
Control voltage	max. 5...18V
Control current	< 0,5...1,5 mA
Current from receiver max.	35 mA
Ambient temperature	-20...+50 °C
Dimensions (mm)	105 x 82 x 38

Mains Powered Splitband Amplifier

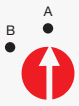
Suitable for SCR systems according to EN 50494 and EN 50607.

DC power supply 18 V

DiSEqC	No DC
1	DC SAT + OUT
2	DC terrestrial
3	DC SAT + OUT + Ter.

Slope correction

Operation mode



A 2 inputs SAT/terrestrial
B 1 input SAT/terrestrial

Level adjuster

SVN 231 F

SAT IF:

- Integrated level adjusting.
- Integrated slope adjusting.
- Amplifier with splitband technology.
- Suitable for SCR systems.
- Usable as an inline amplifier (feed-through of the 22 kHz tone and the DiSEqC™ command).

Terrestrial:

- Integrated level adjusting.

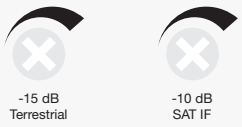
Miscellaneous

- The device is equipped with a switched-mode power supply.

Model Art. No.		SVN 231 F 814118
EAN		4040326141182
Inputs terrestrial/SAT Outputs		1 1/1
Gain Terrestrial 47 … 862 MHz		typ. 20 dB
Gain SAT IF 950 … 2200 MHz		typ. 30 dB
Output level max. 47 … 862 MHz 60 dB IMA_3/EN 60728-3		typ. 105 dBµV
Output level max. 950 … 220 MHz 35 dB IMA_3/EN 60728-3		typ. 111 dBµV
Rejection	Terrestrial/SAT	typ. 25 dB
	SAT/terrestrial	typ. 35 dB
Level adjusting range		0 … -10 dB
Slope correction range/SAT		0 … -12 dB
Mains power supply U~		100-240 V / 47-63 Hz
LNB remote current		max. 18 V / 350 mA
Power consumption incl. LNB		max. 16 W
Ambient temperature		-20 … +50 °C
Dimensions (mm)		250 x 190 x 77

Mains Powered Splitband Amplifier

Integrated level adjuster



SBV 125 NF

For the amplification of SAT IF and terrestrial.

SAT IF:

- Integrated level adjusting.
- Suitable for SCR systems.
- Amplifier with splitband technology.

Terrestrial:

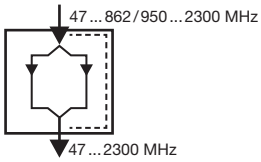
- Integrated level adjusting.

Model Art. No.	SBV 125 NF 810002
EAN	4040326100028
Input/output	1/1
Gain Terrestrial 47…862 MHz	14 ... 18 dB ± 1 dB
Gain SAT IF 950…2400 MHz	18 ... 25 dB ± 1 dB
Output level max. 47…862 MHz 60 dB IMA_3/EN 60728-3	typ. 104 dBµV
Output level max. 950…2400 MHz 35 dB IMA_3/EN 60728-3	typ. 113 dBµV
Level adjusting range SAT IF	0... -10 dB
Level adjusting range terrestrial	0... -15 dB
DC pass	max. 20 V / 400 mA
Mains power supply U~	230 V 50/60 Hz
Power consumption	max. 4 W
Ambient temperature	-20...+50 °C
Dimensions (mm)	175 x 75 x 50

Remote Powered Post Amplifier

NVF 115 F

- For the amplification of SAT IF and terrestrial.
- Splitband technology
- Wideband input and output.
- Feed-through of the 22 kHz tone and the DiSEqC command.



Model Art. No.	NVF 115 F 814117
EAN	4040326141175
Inputs / outputs	1 / 1
Gain Terrestrial 47 ... 862 MHz	7 ... 10 dB ± 1 dB
Gain SAT IF 950 ... 2300 MHz	10 ... 15 dB ± 1 dB
Output level max. 47 ... 862 MHz 60 dB IMA_3 / EN 60728-3	typ. 106 dBµV
Output level max. 950 ... 2300 MHz 35 dB IMA_3 / EN 60728-3	typ. 112 dBµV
Power supply	14 ... 20 V / 210 mA
DC pass per trunk line	max. 20 V / 1A
Ambient temperature	-20 ... +50 °C
Dimensions (mm)	105 x 95 x 38

Remote Powered SAT IF Amplifier

Level adjuster

-10 dB

For the adjustment
of SAT output level.

SVG 128 F

For the amplification of SAT IF

- Feed-through of the 22 kHz tone and the DiSEqC command.
- Integrated level adjuster.
- Integrated precompensating slope.

Model Art. No.	SVG 128 F 821006
EAN	4040326210062
Frequency range	950…2200 MHz
Inputs/outputs	1/1
Gain	typ. 21…28 dB
Output level max. 950…2200 MHz 35 dB IMA_3/EN 60728-3	typ. 110 dBµV
Power supply voltage	10…20 V / 75 mA
DC pass per trunk line	max. 20 V / 600mA
Ambient temperature	-20…+50 °C
Dimensions (mm)	101 x 38 x 25

Remote Powered SAT IF Amplifiers

SVG 10 F, SVG 24 LE

SAT IF:

- All DC through paths are both 22 kHz tone and DiSEqC capable.

Only SVG 24 LE

- Ideal for compensating the attenuation of long cable runs between LNB and amplifier because of precompensating slope.

Modell Art. Nr.	SVG 10 F 821007	SVG 24 LE 814222
EAN	4040326210079	4040326142226
Frequency range	1/1	
Inputs/outputs	950…2200 MHz	
Gain	typ. 10 dB	typ. 16…24 dB
Output level max. 35 dB IMA_3/EN 60728-3	typ. 109 dBµV	
Power supply voltage	10…20 V / 65 mA	10…20 V / 75 mA
DC pass per trunk line	max. 20 V / 1A	
Ambient temperature	-20…+50 °C	
Dimensions (mm)	82 x 27 x 17	

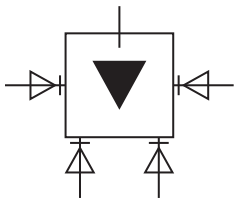
Active Slope Equalizer

SLB 10 F

- With integrated slope precompensation and gain.
- Feed-through of the 22 kHz tone and DiSEqC commands.

Modell Art. Nr.	SLB 10 F 821010
EAN	4040326210109
Frequency range	1/1
Inputs/outputs	950...2200 MHz
Gain	typ. 5...10 dB
Output level max. 35 dB IMA_3/EN 60728-3	typ. 112 dBµV
Power supply voltage	10...20 V / 55 mA
DC pass per trunk line	max. 20 V / 1 A
Ambient temperature	-20...+50 °C
Dimensions (mm)	80 x 27 x 17

4 Way Active SAT IF Splitter



SVA 4 F

For splitting a SAT IF signal on up to four trunk lines.

- DC - pass through all outputs diode decoupled.

Model Art. No.	SVA 4 F 842103
EAN	4040326421031
Inputs/outputs	1/4
Frequency range	950...2200 MHz
Gain	1 dB
Output level max. 35 dB IMA_3/EN 60728-3	typ. 106 dBµV
Power supply voltage	10,5...20 V / 50 mA
DC pass per trunk line	max. 20 V / 500 mA
Ambient temperature	-20...+50 °C
Dimensions (mm)	105 x 90 x 35

Headends

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Headend 16 / 32 x DVB-S/S2 in DVB-C (QAM)

The Q_BOX 16/32 is available in the colors copper and white. When ordering please choose the corresponding color.

Q_BOX 16 / 32

The Q_BOX headend converts DVB-S/S2 into DVB-C (QAM).

There are two different devices available:
1. Q_BOX 16 with 16 QAM output channels
2. Q_BOX 32 with 32 QAM output channels

Features:

- The housing is for wall mounting or the mounting in a 19“ rack.
- Redundant switched-mode power supply.
- Configuration and monitoring via web interface.
- Management port: 10/100 Base-T Ethernet.
- 4 SAT IF and 2 AUX inputs (950 ... 2150 MHz) per 16 QAM channels.
- Terrestrial input for feeding a DVB-T signal.
- Transport stream processing for SAT IF.
- Adjacent channel capable.

Model Art. No.	Q_BOX 16 821654		Q_BOX 32 821658
EAN	4040326216545		4040326216583
Input frequency range	950 ... 2150 MHz		
Input level / impedance	45-85 dBµV / 75 Ohm		
LNB power and control (valid for Q_BOX 16/32)	Vertical, Low	0 V / 13 V	500 mA max. total
	Horizontal, Low	0 V / 18 V	
	Vertical, High	0 V / 13 V 22 kHz or DiSEqC	
	Horizontal, High	0 V / 18 V 22 kHz or DiSEqC	
	Aux 1	0 V / 13 V	250 mA max. total
	Aux 2	0 V / 18 V	
Modulation	DVB-S (QPSK)	DVB-S2 (QPSK/8PSK)	
Symbol rate	2 - 45 MS/s	2 - 45 MS/S (QPSK, 2 - 31,5 MS/s (8PSK)	
Code rate	1/2, 2/3, 3/4, 5/6, 7/8	QPSK 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 8PSK 3/5, 2/3, 3/4, 5/6, 8/9, 9/10	
Input roll off	35 %	20 %, 25 %, 35 %	
Signal processing	ETS 300 421	ETS 302 307	
Output frequency range	48 - 858 MHz, by step 100 kHz		
RF channel allocation	independent from other channels		
Output level per carrier / impedance	typ. 87 dBµV / 75 Ohm		
Total output level adjustment	0 ... -15 dB by 0.5 dB step		
MER	> 40 dB		
Modulation DVB-C	QAM16, QAM32, QAM64, QAM128, QAM256		
Output channel bandwidth/ symbol rate	4 ... 8,3 MHz / 3,5 ... 7,2 MS/s		
Output roll off	15 %		
Output signal processing	EN 300 429, ITU T J.83 A (Annex A)		
Loop through frequency range	45 - 862 MHz		
Loop through loss	typ. 3 dB		
Input data rate	max. 90 Mbps per transponder		
Supply voltage	200 - 240 V / 50 Hz		
Power consumption	max. 65 W		max. 115 W
Operating temperature	- 10° ... + 45 ° Celsius		
Dimensions in mm	486 x 356 x 150		

DVB-S/S2 into DVB-C

- Integrated 2x8 matrix
- TS processing:
  any service to any output; PCR restamping;
  service filtering; PSI/SI regeneration;
  NIT generation; PMT version monitoring
- BISS descrambling
- Web control and SNMP monitoring
- Loop through RF distributing at input and output
- DIN rail or wall mounting
- Connectors:
  RF input/output - type F
  Ethernet control interface - RJ-45
  screw terminal block for DC entry
  power distribution bus
- Power supply not included in scope of delivery

SQ-480

SQ-420C

Model Art. No.		SQ-480 810008
EAN		4040326100080
Sections input/output		8/8
RF input	Frequency range (SC)*	950…2150 MHz
	LNB powering/control (SC)*	0/13/18 V & 22 kHz, 500 mA total, DiSEqC 1.0, EN50494, EN50607
	Level/impedance	55-95 dBµV / 75 Ω
	Modulation	QPSK, 8PSK (DVB S/S2)
	Symbol rate (SC)*	2 ... 45 Ms/s
	Return loss	≥ 10 dB
	RF input count	2
	Loop through frequency range / loss	950-2150 MHz / ≤ 1.5 dB
RF Output	DVB standard (SC)*	DVB-C
	Frequency range (SC)*	96 ... 862 MHz
	Channel allocation, adjacent	4 + 4
	Level/impedance	90 ± 2 dBµV/75 Ω
	TS bit rate	< 53 Mbit/s
	MER	≥ 40 dB
	Modulation (SC)*	QAM16, QAM32, QAM64, QAM128, QAM256
	Channel bandwidth (SC)*	4...8.3 MHz
	Symbol rate (SC)*	3.5... 7.2 Ms/s
	Return loss	≥ 10 dB
	Roll off	15%
	Total output level adjustment (SC)*	0... -15.0 dB by 1 dB step
	Loop through frequency range / loss	45 ... 862 MHz / ≤ 2.5 dB
Management port		standard IEE802.3 10/100 Base T
Current consumption**		12 V /1.1A
Ambient temperature		0°... + 45° C
Dimensions (mm)		48.5 x 198 x 112

* Software control (SC) ** Without external DC feeding

DVB-S/S2 into DVB-C

- Common interface
- TS processing:
  service multiplexing - any input to any output;
  PCR restamping; PSI/SI regeneration;
  NIT generation; PMT version monitoring
- Web control and SNMP monitoring
- Loop through RF distributing at input and output
- DIN rail or wall mounting
- Connectors:
  RF input/output - type F
  Ethernet control interface - RJ-45
  2xCI ports - PCMCIA
  screw terminal block for DC entry
  power distribution bus
- Power supply not included in scope of delivery
- T2-MI deencapsulation is supported only in M.1 version;
  M.1 version can be requested.

Model Art. No.		SQ-420C 810005	
EAN		4040326100059	
Number of channels		2	
RF input	Frequency range (SC)*	950 … 2150 MHz	
	LNB powering/control (SC)*	0/13/18 V & 22 kHz, 500 mA max. DiSEqC 1.0, EN50607, EN50494	
	Level/impedance	45-85 dBµV / 75 Ω	
	Loop through gain	-1 ± 1 dB	
	Standard (SC)*	DVB-S	DVB-S2**
	Modulation	QPSK	QPSK, 8PSK APSK 8/16/32
	Symbol rate (SC)*	2 ... 45 Ms/s	2 ... 45 Ms/s
	Code rate	1/2, 2/3, 3/4, 5/6, 7/8	QPSK 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 8PSK 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
	Roll off	35 %	20 %, 25 %, 35 %
RF Output	Frequency range (SC)*	100 - 858 MHz, by step 100 kHz	
	Channel allocation	adjacent	
	Level/impedance	90 ± 2 dBµV/75 Ω	
	Return loss	≥ 14 dB at 47 MHz; -1.5 dB/oct., but not less 10 dB	
	Spurious level	< -60 dB	
	MER	≥ 40 dB	
	Modulation DVB-C (SC)*	QAM16, QAM32, QAM64, QAM128, QAM256	
	Channel bandwidth / symbol rate (SC)*	4...8.3 MHz / 3.5 ÷ 7.2 MS/s	
	Roll off	15 %	
	Signal processing	EN 300 429, ITU-T J.83 A (Annex A)	
	Total output level adjustment (SC)*	0 ÷ -15.0 dB by 1 dB step	
	Loop through frequency range / loss	47 ... 2150 MHz/ ≤ 2.5 dB	
Transport stream parameters	Max. bit rate	output 53 Mbps	
	Max. PID filter count	unlimited	
Management port		standard IEE802.3 10/100 Base T	
Current consumption***		12 V /550 mA	
Ambient temperature		0°... + 45° C	
Dimensions (mm)		48.5 x 198 x 112	

* Software control (SC)

** Supports physical layer scrambling (PLS) and multiple input streams (MIS)

*** Without external DC feeding and CAM, with two CAM´s =0.85 A

DVB-S/S2 into DVB-T

- Integrated 2x8 matrix
- TS processing:
  any service to any output; PCR restamping;
  service filtering; PSI/SI regeneration;
  NIT generation; PMT version monitoring
- BISS descrambling
- Web control and SNMP monitoring
- Loop through RF distributing at input and output
- DIN rail or wall mounting
- Connectors:
  RF input/output - type F
  Ethernet control interface - RJ-45
  screw terminal block for DC entry
  power distribution bus
- Power supply not included in scope of delivery

ST-480

ST-420C

Model Art. No.		ST-480 810007
EAN		4040326100073
Sections input/output		8/8
RF input	Frequency range (SC)*	950…2150 MHz
	LNB powering/control (SC)*	0/13/18 V & 22 kHz, 500 mA total, DiSEqC 1.0, EN50494, EN50607
	Level/impedance	55-95 dBµV / 75 Ω
	Modulation	QPSK, 8PSK (DVB S/S2)
	Symbol rate (SC)*	2 ... 45 Ms/s
	Return loss	≥ 10 dB
	RF input count	2
	Loop through frequency range / loss	950 ... 2150 MHz / ≤ 1.5 dB
RF Output	DVB standard (SC)*	DVB-T
	Frequency range (SC)*	170 ... 230 MHz / 470 ... 862 MHz
	Channel allocation, adjacent	4 + 4
	Level/impedance	90 ± 2 dBµV/75 Ω
	TS bit rate	< 31 Mbit/s
	MER	≥ 35 dB
	Modulation (SC)*	QPSK, QAM16, QAM64
	Channel bandwidth (SC)*	7 MHz / 8 MHz
	Guard interval (SC)*	1/4, 1/8, 1/16, 1/32
	Return loss	≥ 10 dB
	Code rate (SC)*	1/2, 2/3, 3/4, 5/6, 7/8
	Transmission mode	2K
	Total output level adjustment (SC)*	0... -15.0 dB by 1 dB step
	Loop through frequency range / loss	45 ... 862 MHz / ≤ 2.5 dB
Management port		standard IEE802.3 10/100 Base T
Current consumption**		12 V /1.1A
Ambient temperature		0°... + 45° C
Dimensions (mm)		48.5 x 198 x 112

* Software control (SC) ** Without external DC feeding

DVB-S/S2 into DVB-T

- Common interface
- TS processing:
  service multiplexing - any input to any output;
  PCR restamping; PSI/SI regeneration;
  NIT generation; PMT version monitoring
- Web control and SNMP monitoring
- Loop through RF distributing at input and output
- DIN rail or wall mounting
- Connectors:
  RF input/output - type F
  Ethernet control interface - RJ-45
  2xCI ports - PCMCIA
  screw terminal block for DC entry
  power distribution bus
- Power supply not included in scope of delivery
- T2-MI deencapsulation is supported only in M.1 version;
  M.1 version can be requested.

Model Art. No.		ST-420C 810006	
EAN		4040326100066	
Number of channels		2	
RF input	Frequency range (SC)*	950…2150 MHz	
	LNB powering/control (SC)*	0/13/18 V & 22 kHz, 500 mA max. DiSEqC 1.0, EN50607, EN50494	
	Level/impedance	45-85 dBµV / 75 Ω	
	Loop through gain	-1 ± 1 dB	
	Standard (SC)*	DVB-S	DVB-S2**
	Modulation	QPSK	QPSK, 8PSK APSK 8/16/32
	Symbol rate (SC)*	2 ... 45 Ms/s	2 ... 45 Ms/s
	Code rate	1/2, 2/3, 3/4, 5/6, 7/8	QPSK 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 8PSK 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
	Roll off	35 %	20 %, 25 %, 35 %
RF Output	Frequency range (SC)*	100 ... 858 MHz, by step 100 kHz	
	Channel allocation	adjacent	
	Level/impedance	90 ± 2 dBµV/75 Ω	
	Spurious level	< -60 dB	
	MER	≥ 38 dB (100 ... 780 MHZ); ≥ 35 dB (780 ... 860 MHz)	
	Modulation DVB-T	QPSK, QAM16, QAM64	
	Channel bandwidth	7/8 MHz	
	Guard interval	1/4, 1/8, 1/16, 1/32	
	Code rate	1/2, 2/3, 3/4, 5/6, 7/8	
	Transmission mode	2K	
	Total output level adjustment (SC)*	0 ÷ -15.0 dB by 1 dB step	
	Loop through frequency range / loss	47 ... 862 MHz/ ≤ 2.5 dB	
Transport stream parameters	Max. bit rate	output 31670 kbps	
	Max. PID filter count	unlimited	
Management port		standard IEE802.3 10/100 Base T	
Current consumption***		12 V /550 mA	
Ambient temperature		0°... + 45° C	
Dimensions (mm)		48.5 x 198 x 112	

* Software control (SC)

** Supports physical layer scrambling (PLS) and multiple input streams (MIS)

*** Without external DC feeding and CAM, with two CAM´s =0.85 A

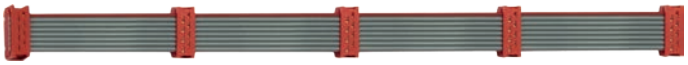
Power supply for SQ-480, SQ-420C, ST-480, ST-420C

- Switch-mode technology
- Short circuit and overload protected
- DIN rail or wall mounting
- Connectors:
  screw terminal block for DC output
  power distribution bus
- DC connection cable included in scope of delivery

Model Art. No.	SP-413 810004
EAN	4040326100042
Input voltage	187-250 V~ 50/60 Hz
Output voltage, current	max. 12 V 4.5 A
Power consumption	max. 65 W
Ambient temperature	0°... + 45° C
Dimensions (mm)	48 x 198 x 108

DC connection cable

- Power distribution cable for the supply of operating voltage between power supply and modules (SQ-480, SQ-420C, ST-480 and ST-420C).



Model Art. No.	DC-12V/4 810009
EAN	4040326100097
Voltage range	max. 12 V DC
Ambient temperature	0°... + 45° C
Length in (mm)	240

CATV

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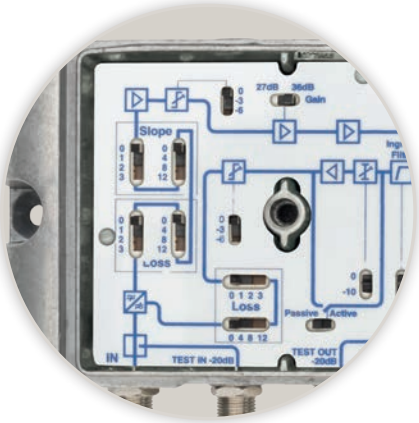
CATV and Line Amplifier



HLV 36/30 NF, HLV 36/65 NF

- Active and passive return path.
- For medium sized distribution systems.
- External test ports (-20 dB) at input and output.
- LED indicator for power supply.

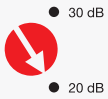
Model Art. No.	HLV 36/30 NF 813132	HLV 36/65 NF 813133
EAN	4040326131329	4040326131336
Inputs/outputs	1/1	1/1
Frequency range; forward path	47 ... 1006 MHz	87 ... 1006 MHz
Gain, switchable; forward path	27 / 36 dB	
Level adjustment	0 ... -15 dB by 1 dB steps	
Slope adjustment	0 ... -15 dB by 1 dB steps	
Interstage equalizer	-6 / -3 / 0 dB	
Output level forward path max. CTB, CSO (EN50083-3)*	typ. 109 dBµV	
Output level forward path max. 60 dB IMA_3/EN 60728-3	typ. 118 dBµV	
Frequency range; return path	5 ... 30 MHz	5 ... 65 MHz
Gain, switchable; return path	27 / -3 dB	
Level adjustment	0 ... -15 dB by 1 dB steps	
Output level return path max. 60 dB IMA_3/EN 60728-3	typ. 109 dBµV	
Mains power supply U~	230 V 50/60 Hz	
Power consumption	max. 7 W	
Ambient temperature	-20 ... +50 °C	
Dimensions (mm)	185 x 91 x 47	

* with 6 dB interstage equalizer

MATV and Home Distribution Amplifier

Integrated attenuator and slope control

Forward gain switchable



HNV 30/30 UPE
HNV 30/65 UPE

- Passive return path.
- For medium sized distribution systems.

Miscellaneous:

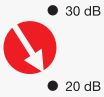
- The devices are equipped with a switched-mode power supply.

Model Art. No.	HNV 30/30 UPE 811267	HNV 30/65 UPE 811268
EAN	4040326112670	4040326112687
Inputs/outputs	1/1	1/1
Gain	47 … 862 MHz/30 or 20 dB	85 … 862 MHz/30 or 20 dB
Output level forward path max. 60 dB IMA_3/EN 60728-3	typ. 108 dBµV	typ. 108 dBµV
Level adjusting range	0 … -12 dB	0 … -12 dB
Slope correction range	0 … -15 dB	0 … -15 dB
Mains power supply U~	100-240 V / 47 – 63 Hz	100-240 V / 47-63 Hz
Power consumption	max. 5 W	
Ambient temperature	-20 … +50 °C	-20 … +50 °C
Dimensions (mm)	194 x 86 x 52	194 x 86 x 52

MATV and Home Distribution Amplifiers

Integrated attenuator and slope control

Forward gain switchable



Optional:
Universal AC Adapter
SNG 18/1000 (Art. No.: 832114)
in combination with Line Power Injection **Filter FSW 40 F (Art. No.: 871333).**

HNV 30 UPE, HNF 30 URP

- For MATV and CATV systems.
- Remote powering on input and output side (only HNF 30 URP).
- For HNF 30 URP the maximum permitted remote power is 20V / 500 mA.

Miscellaneous:

- The device is equipped with a switched-mode power supply (only for HNV 30 UPE).

Tech hint HNF 30 URP

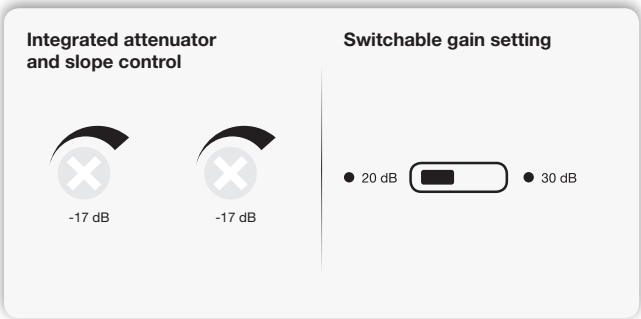
The remote power is available on the input and output side. This has the advantage that another remote powered amplifier can be supplied with voltage. On ports where it is not desired, a **DCF 500 (set of 2 pcs. Art.No.: 871506**) must be used.

Model Art. No.	HNV 30 UPE 811269	HNF 30 URP 811304
EAN	4040326112694	4040326113042
Inputs/outputs	1/1	1/1
Gain 47…862 MHz	30 or 20 dB	30 or 20 dB
Output level max. 60 dB IMA_3/EN 60728-3	typ. 108 dBµV	typ. 108 dBµV
Level adjusting range	0…-12 dB	0…-12 dB
Slope correction range	0…-15 dB	0…-15 dB
Mains power supply U~	100-240 V / 47-63 Hz	15…20 V / 200 mA
Power consumption	max. 5 W	max. 5 W
Ambient temperature	-20…+50 °C	-20…+50 °C
Dimensions (mm)	194 x 86 x 52	138 x 83 x 52

Home Amplifier

HNV 29 NF

- Built in level adjuster and slope equalizer.



Model Art. No.	HNV 29 NF 810000
EAN	4040326100004
Inputs/outputs	1/1
Test point	-30 dB
Gain	47 ... 862 MHz/18-20 or 27-30 dB
Output level max. 60 dB IMA_3/EN 60728-3	typ. 107 dBµV
Level adjusting range	0 ... -17 dB
Slope correction range	0 ... -17 dB
Mains power supply U~	230 V 50/60 Hz
Power consumption	max. 3,5 W
Ambient temperature	-20 ... +50 °C
Dimensions (mm)	175 x 75 x 50

The WhiteLine device series

The WhiteLine includes the following products:

- **HNV 29 NF** Home amplifier (page 93)
- **MBV 430 NF** Multiband amplifier (page 96)
- **SBV 125 NF** Splitband amplifier (page 77)
- **VAM 110 NF** Audio/Video modulator (page 99)

Terrestrial

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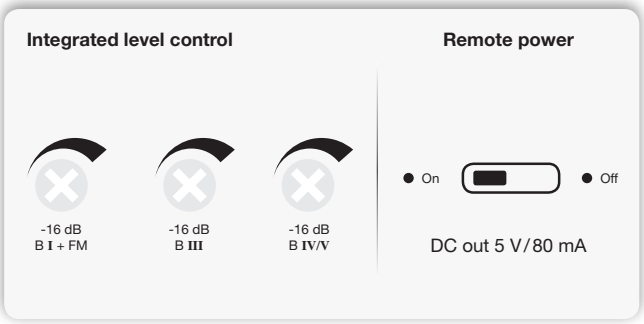
Multiband Amplifier

MBV 430 NF

- Selective input frequency range.
- Remote power for DVB-T antenna available.



Model Art. No.	MBV 430 NF 810001
EAN	4040326100011
Inputs/outputs	3/1
Test point	-20 dB
Gain B I + FM (47-108 MHz)	30 dB
Gain B III (174-230 MHz)	30 dB
Gain B IV/V (470-862 MHz)	35 dB
Output level max. 60 dB IMA_3/EN 60728-3	typ. 106 dBµV
Level adjustment range	0 … -16 dB
DC output	max. 5 V/80 mA
Mains power supply U~	230 V 50/60 Hz
Power consumption	max. 2,7 W
Ambient temperature	-20 … +50 °C
Dimensions (mm)	175 x 75 x 50

Multiband Diplexer

MBW 410 WSG

- To combine 4 frequency bands on one cable.
- Selective input frequency range.
- For pre-feeding of products with a wideband terrestrial input.

Model Art. No.	MBW 410 WSG 871113
EAN	4040326711132
Inputs / outputs	4 / 1
Through loss B I	1,5 dB
Through loss FM	1 dB
Through loss B III	1,5 dB
Through loss B IV/V	2 dB
Ambient temperature	-20 ... +50 °C
Dimensions (mm)	140 x 82 x 38

FM Amplifier

VFM 25 F

- For the selective amplification of the FM frequency range.
- For pre-feeding of products with a wideband terrestrial input.

Miscellaneous:

- The device is supplied with a switched-mode power supply.

Model Art. No.	VFM 25 F 810202
EAN	4040326102022
Inputs / outputs	1 / 1
Frequency range	87,5 ... 108 MHz
Gain	25 dB
60 dB KMA / EN 60728 - 5	118 dBµV
Level adjusting range	0 ... - 10 dB
Mains supply U~	100 - 240 V / 47 - 63 Hz
Power consumption	max. 3 W
Ambient temperature	-20 ... +50 °C
Dimensions (mm)	160 x 86 x 52

FM Band - Pass

FMS 30

- Selective reception of FM channels.
- For pre-feeding of products with a wideband terrestrial input.

Model Art. No.	FMS 30 821001
EAN	4040326210017
Inputs/outputs	1/1
Frequency range	87,5 ... 108 MHz
Through loss	typ. 1 dB
Selection	typ. 30 dB
Ambient temperature	-20 ... +50 °C
Dimensions (mm)	80 x 26,5 x 16,5

LTE Filter SLTE 30

SLTE 30

- The frequency range of commercial DVB-T receivers is the complete UHF-band up to channel 69.
- The frequency range of 790 MHz up to 862 MHz (channels 61 to 69) is used for wireless broadband services in some areas. This can cause interferences in the reception of DVB-T signals. By using the SPAUN LTE Filter the LTE 800 signal is attenuated and this increases the quality of DVB-T reception.
- The SLTE 30 works as Low Pass Filter.

Model Art. No.	SLTE 30 865050
EAN	4040326650509
Filter type	low-pass filter
Pass band	5 ... 790 MHz
Stopp band	791 ... 862 MHz
Insertion loss max. 3 dB	5 ... 785 MHz
Attenuation	
@ 787 MHz	3,2 dB
@ 791 MHz	3,9 dB
@ 793 MHz	4,6 dB
@ 823 MHz	35 dB
Impedance	75 Ω
Connectors	F connector/F jack
Ambient temperature	-20 ... +55 °C
Dimensions (mm)	75, 25 Ø

Audio / Video - Modulator analogue (PAL)

VAM 110 NF

- For use between video camera and the TV.
- The modulator output is not adjacent channel compatible.
- Internal test pattern generator can be activated by function key.
- Possibility to connect an additional terrestrial signal.

Model Art. No.		VAM 110 NF 810003
	EAN	4040326100035
	Video - /Audio - Inputs	1 / 1
	TV standard	B / G /Au/stereo A2 D/K/H/I/L/M/N/mono (UHF & VHF ranges)
	RF Connector	F-connector
	Audio / Video connector	RCA socket
RF output	Output level	typ. 85 dBµV
	Level adjustment	0 … -20 dB
	Frequency range	45 … 84 MHz 170 … 300 MHz 470 … 862 MHz
Video	Frequency range	20 Hz … 6 MHz
	Input impedance	75 Ω
Audio	Frequency range	20 Hz … 15 kHz
	Input impedance	10 kΩ
	Input level	2 x 775 mV RMS
	Level adjustment	+6 … -6 dB (in 2 dB steps)
Power	Mains power supply U~	230 V 50/60 Hz
	Power consumption	max. 4 W
	Ambient temperature	0 … +50 °C
	Dimensions (mm)	175 x 75 x 50

SOLVx 1 Optical Repeater

(page 18)

The optical repeater SOLVx 1 offers the possibility to realize further optical nodes within an optical distribution network.

Measurement

TABLE OF CONTENTS

TV Signal Analyzers SPAROS 800, 808 and 888

Comparision sheet
SPAROS 800, 808, 888
at page 105

10“ Touch display enables a simultaneous figure of measurements and spectrum.

SPAROS 800, 808 and 888

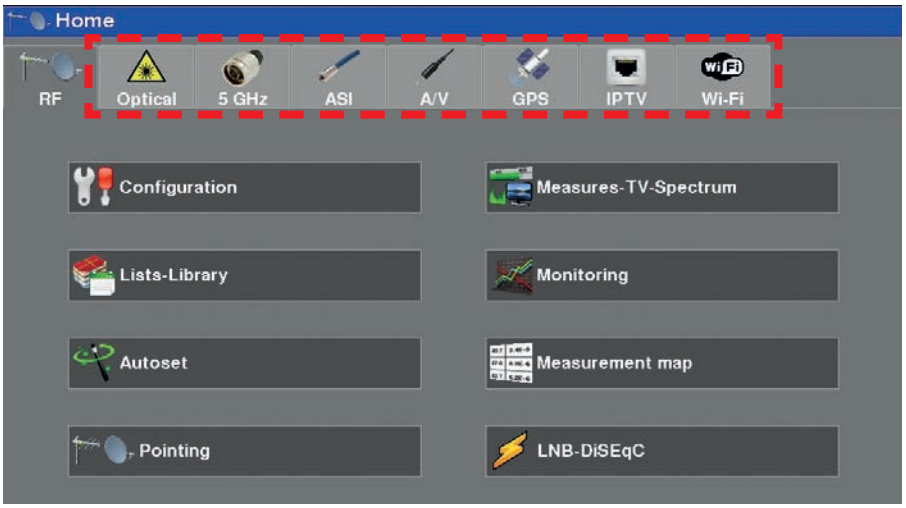
Features:

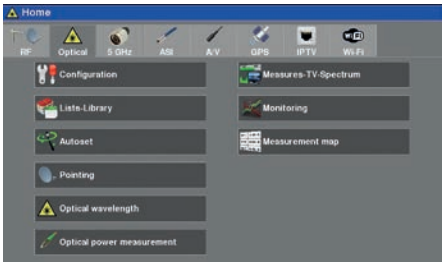
- All modulation types DVB-S/S2, DVB-C/C2 (J83-A and B) and DVB-T/T2 are supported.
- Operation with a 10“ LCD touch screen.
- Split screen for the simultaneous figure of measurements and spectrum.
- Powerful lithium-ion battery with a duration of up to 4 hours.
- TV picture mode for digital TV programs.
- Fast spectrum analyses.
- Constellation diagram for all digital types of modulation.
- Ethernet and USB interface.
- DiSEqC and SCR (EN 50494 & EN 50607) support.
- Please refer to page 105 for a comparision sheet about the different functions of the three TV analyzers.

Included in scope of delivery:

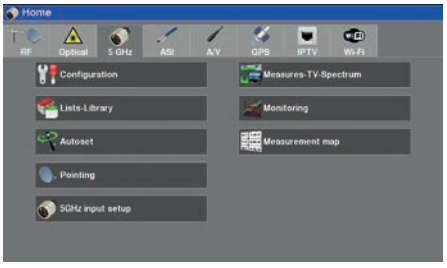
- **SPAROS TV Signal Analyzer**
- Protection lid
- AC / DC power unit
- Supplied in a metal transport case.
- USB stick with an extensive operating manual (PDF)

One menu bar to easily select the functions or specific input

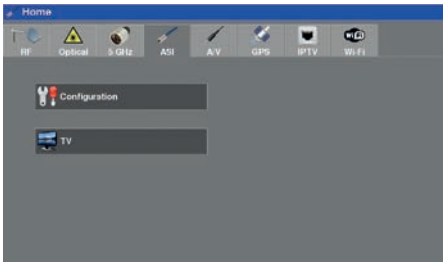




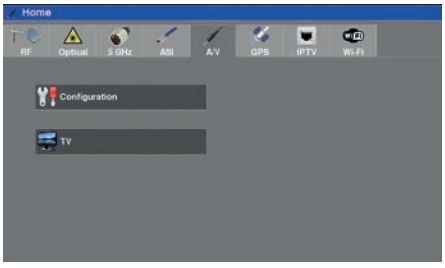
For measuremets in optical distribution networks.



The 5 GHz input is dedicated to specific 5 GHz LNB for dishes.

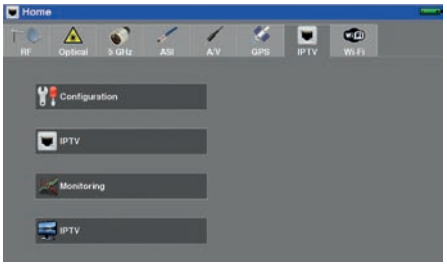


For head end broadcasting stations the ASI input / output provides the transport stream analysis.

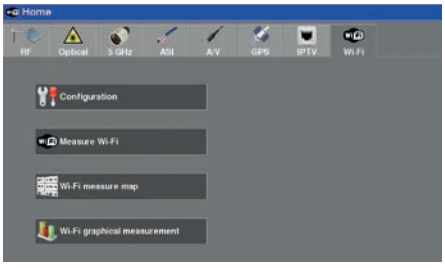


Some TV networks still use analog programs. SPAROS provides the TV programs decoding and display.

The use of the internal GPS receiver allows measurements to be assigned to geographic coordinates.



Many features to test your IPTV networks.



WiFi networks can be analyzed with these features.

SPAROS 800 / 808 / 888 Touch Comparison sheet

Function overview	SPAROS 800 Touch	SPAROS 808 Touch	SPAROS 888 Touch
Art. No.	850042	850043	850044
Bandwidth	5 ... 1005 MHz & 900 ... 2200 MHz		
HEVC H.265 decoding	✔	✔	✔
MPEG-2, MPEG-4 HEVC H.264 decoding	✔	✔	✔
DVB-T/T2/T2Lite, DVB-C/C2, DVB-S/S2(MS)	✔	✔	✔
DVB-C/C2: J83A, J83B	✔	✔	✔
Fast spectrum analysis	✔	✔	✔
Impulse response; echoes and pre-echoes in DVB-T and DVB-T2	✔	✔	✔
Constellation diagramm for all standards	✔	✔	✔
DCSS and SatCR (EN 50607 & EN 50494)	✔	✔	✔
External software (SPAROS organizer)	✔	✔	✔
Display free HD 2k programs for terrestrial, cable and satellite	✔	✔	✔
Analog program decoding and display	✔	✔	✔
Video IN / OUT	✔	✔	✔
HDMI output	✔	✔	✔
MER per carrier	✔	✔	✔
Ethernet interface with webserver	✔	✔	✔
CAM common interface	✔	✔	✔
ASI IN / OUT	-	✔	✔
IPTV decoding and analysis	-	✔	✔
WiFi (2,4 GHz & 5,6 GHz)	-	✔	✔
Shoulder measurment	-	-	✔
Network delay analysis (for DVB-T)	-	-	✔
MPEG TS analysis (ETR 101-290, bit rate)	-	-	✔
TV programs recording on SD memory card	-	-	✔
Optical input	-	-	✔
DAB, DAB+, FM-RDS	-	-	✔
GPS	-	-	✔

Technical data for SPAROS 888 Touch

	Terrestrial band							Satellite band	
Frequency									
Range	5 ... 1005 MHz							900 ... 2200 MHz	
Resolution	measurement: 50 kHz, display: 1 kHz							measurement: 1MHz, display: 1MHz	
Level measurements									
Dynamic range	20 ... 120 dBµV							20 ... 120 dBµV	
Noise floor level	10 dBµV typical							20 dBµV typical	
Units	dBµV, dBmV, dBm							dBµV, dBmV, dBm	
Accuracy	± 2 dB +/- 0.05 dB /°C							± 2 dB +/- 0.05 dB /°C	
Resolution	0.1 dB							0.1 dB	
Measurement filters	25 kHz							125 kHz	
Standards	BG, DK, I, L, MN, FM, DAB/DAB+, Porteuse, DVB-T/T2/T2lite, DVB-C/C2, J83B							PAL, SECAM, NTSC, Porteuse, DVB-S/S2, DSS	
Measurements	RF, C/N, V/A							RF, C/N	
Numerical measurements	DVB-T/H	DVB-T2/T2lite	DVB-C	DVB-C2	J83B	DAB/DAB+	FM-RDS	DVB-S; DSS	DVB-S2
Bit Error rate	CBER (before Viterbi BERi) VBER (after Viterbi BERo) UNC (lost packets PER) Noise margin	LDPC (BERi) BCH (BERo) PER (frame error PER) Noise margin	BER (before Reed Solomon BERi) UNC (lost packets PER) Noise margin	BER (before Reed Solomon BERi) UNC (lost packets PER) Noise margin	BER (after Reed Soloman BERo) UNC (lost packets PER) Noise margin	BER (after Reed Soloman BERo)	PS, PI, OTY ECC, RT	CBER (before Viterbi BERi) VBER (after Viterbi BERo) UNC (lost packets PER) Link margin	LDPC (BERi) BCH (BERo) PER Link margin
Modulation Error rate	5 - 35 dB	5 - 35 dB	20 - 40 dB	20 - 40 dB	20 - 35 dB	0 - 30 dB	-	0 - 20 dB	
MER per carrier	yes	yes	-	yes	-	-			
Symbol rate	-	-	1 to 7.224 Ms/s (J.83A)	-	1 to 5.563 MS/s	-	-	1 to 45 MS/s	1 to 45 MS/s
Bandwidth	5, 6, 7, 8 MHz	1.7,5,6,7,8 MHz	-	6, 8 MHz	-	1.7 MHz	-	-	-
Mode	-	SISO, MISO, PLP simple or multiple	-	PLP simple or multiple data slice	-	Band 3, Mode 1	-	-	-
FET size	2k and 8k, auto and manual	1k, 2k, 4k, 8k, 16k and 32k + bandwidth extension, auto	-	4k	-	2k	-	-	-
Constellation	QPSK, 16 and 64QAM, auto	QPSK, 16, 64 and 256QAM, auto	16, 32, 64, 128 and 256QAM	16,64, 256, 1024, 4096QAM	64, 256QAM	DQPSK	-	QPSK	QPSK, 8PSK, 16 APSK, 32 APSK
Code rate	1/2, 2/3, 3/4, 5/6, 7/8 (auto)	1/2, 3/5, 2/3, 3/4, 4/5, 5/6 (auto)	-	2/3, 3/4, 4/5, 5/6, 8/9, 9/10	-	-	-	1/2, 2/3, 3/4, 5/6, 6/7, 7/8 (auto)	2/5, 1/2, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (auto)
Guard interval	auto and manual	auto	-	auto	-	-	-	-	-
Inverted spectrum	auto	auto	auto	auto	auto	-	-	auto	auto
HP/LP	yes	-	-	-	-	-	-	-	-
PLP choice	-	yes	-	yes	-	-	-	-	-
Multistream	-	-	-	-	-	-	-	-	yes, PL descrambling
Standards	ETS 301-701	ETS 302-755	ITU J83-AppendixA	ETS 302-769	ETS 302-769	ETS 300-401	IEC 62106	ETS 300-421	ETS 302-307
Pre-echoes / Echoes / Impulse response									
Dynamic range	30 dB, 75km (en 8k)	50 dB, -75km +75km (en 8k)		50 dB, -5km +5km				-	-
Units	µs, km, miles	µs, km, miles		µs, km, miles				-	-
Constellation diagramm	yes	yes	yes	yes	yes			yes	yes

Technical data for SPAROS 888 Touch

	Terrestrial band	Satellite band
Spectrum anallysis		
Span	1MHz to full span in 1, 2, 5 sequences	
Sweep time	100ms mini, 500 ms maxi	
Filters (automatic with selected span)	1,25k, 2,5k, 6,25k, 12,5k, 25k, 62,5k, 125k, 250k, 625kHz, 1,25MHz, 2,5MHz	
Attenuator	automatic or manual (0 to 50 dB with 10 dB steps)	
Dynamic (display)	60 dB (10 dB/div)	
With NIT (OSD) and TV picture	yes	
Measurement map		
Capacity	scrolling of 100 programs maximum	
Display	graphical (bargraph), tilt measurement	
Antenna Check mode		
Goal	fast antenna pointing	fast antenna pointing, single or double LNB
Places/Satellites	30 places typical	30 satellites typical, with European database loaded
NIT check	yes ckeck 4 channels per place, can be modified by user	yes ckeck 4 channels per place, can be modified by user
Signal Monitoring		
Measurements	all, level and digital measurements	
Duration	10 min, 60 min, 8h, 24h, 7d	
Memory		
Saving	internal non volatile memory, or USB memory stick (not supplied)	
Data	places, measure (level, BER/MER, frequency map, spectrums,...)	
Capacity	512 Kb (1000 files or folders max.)	
TV picture and sounds		
Analog programs	PAL, SECAM, NTSC	
Digital programs	MPEG2, MPEG4, HEVC, SD and HD definition	
Sounds	MPEG-1, MPEG-2, AAC, HE AAC, Dolby® Digital, Dolby® Digital Plus	
Encrypted programs *	yes	
MPEG TS analysis	ETR101290 alarms, bit rate analysis	
RF input		
Input	75 Ohm, F and BNC with adapter supplied	
Max. permissive voltage	50 Vrms /50Hz	
Remote supply and control		
Voltage	5V/13V/18V/24V, 500 mA max (300mA pour 24V)	13/18 V, 500 mA max
DiSEqC	-	DiSEqC 1.2, dish rotor control, committed & uncommitted switches
Mini DiSEqC (22kHz)	-	22 kHz, ToneBurst
SatCR	-	DiSEqC protocol extension, control of 8 slots max.
DCSS	-	SatCR protocol extension, control of 32 slots max.
Aux Input/output		
Interfaces	USB A, Ethernet 10baseT (RJ45)	
Power supply input	jack 5.5 mm, 15 V max, 5 A max	
Audio / Video	HDMI output 720p, A/V jack for analog video input and earphones output	

Technical data for SPAROS 888 Touch

	Terrestrial band	Satellite band
ASI		
Functions	ASI input and output TS MPEG	
Frequency	270 MHz, 188/204 bytes, useful bit rate 70Mbit/s max	
Connector	BNC 75 Ohm	
Optical Input		
Functions	optical power meter, referenced measurement, all measurement after RF conversion	
Wavelengths	1310, 1490, 1550 nm (optical splitter included)	
Connector	FC-APC, monomode fiber	
5 GHz input		
Functions	all level and digital measurements	
Connector	SMA 50 Ohm	
Remote supply	6,2V, 250mA	
GPS		
Functions	measurement mapping (export to GoogleEarth), sat in view' monitoring	
Connector	SMA 50 Ohm	
Antenna	active 3V or 5V	
WI-Fi		
Functions	Wi-Fi network level measurement, SSID	
Frequency	2,4 and 5GHz	
WiFi antenna input	SMA reverse 50 Ohm, antenna	
IPTV		
Functions	Streaming TV, network measurement (IAT,...)	
Connector	RJ45 Ethernet 10/100/1000 Mbps	
Protocol	UDP/RTP protocol	
Transmission	Multicast, IGMP, SMPTE-2022	
General specifications		
Display	10.1 inches color LCD 16/9, backlight 500 cd/m^2, 1280x800 dots, capacitive touch pad	
Power supply	main adapter 110/230 VAC, jack with 5,5mm diameter, 15 V/5 A	
Battery (non removable)	LiOn battery 100W	
Autonomy	4 hours typical	
Built-in charger	1 hour charging time for 80% capacity	
Operating temperature	-5°C to 45°C	
Storage temperature	-10°C to 60°C	
EMC and safety	NF-EN 61362-1 / NF-EN 61326-3 / NF-EN 61010-1	
Dimensions	310 x 210 x 80 mm	
Weight	2,8 kg (battery and pouch included)	

(*): the display of digital encrypted programs is possible, if user has a valid subscription card and if the encryption type is supported by the TV meter.

Technical data for SPAROS 808 Touch

	Terrestrial band					Satellite band	
Frequency							
Range	5 ... 1005 MHz					900 ... 2200 MHz	
Resolution	measurement: 50 kHz, display: 1 kHz					measurement: 1MHz, display: 1MHz	
Level measurements							
Dynamic range	20 ... 120 dBµV					20 ... 120 dBµV	
Noise floor level	10 dBµV typical					20 dBµV typical	
Units	dBµV dBmV, dBm					dBµV, dBmV, dBm	
Accuracy	± 2 dB +/- 0.05 dB /°C					± 2 dB +/- 0.05 dB /°C	
Resolution	0.1 dB					0.1 dB	
Measurement filters	25 kHz					125 kHz	
Standards	BG, DK, I, L, MN, FM, DAB/DAB+, Porteuse, DVB-T/T2/T2lite, DVB-C/C2, J83B					PAL, SECAM, NTSC, Porteuse, DVB-S/S2, DSS	
Measurements	RF, C/N, V/A					RF, C/N	
Numerical measurements	DVB-T/H	DVB-T2/T2lite	DVB-C	DVB-C2	J83B	DVB-S; DSS	DVB-S2
Bit Error rate	CBER (before Viterbi BERi) VBER (after Viterbi BERo) UNC (lost packets PER) Noise margin	LDPC (BERi) BCH (BERo) PER (frame error PER) Noise margin	BER (before Reed Solomon BERi) UNC (lost packets PER) Noise margin	BER (before Reed Solomon BERi) UNC (lost packets PER) Noise margin	BER (after Reed Soloman BERo) UNC (lost packets PER) Noise margin	CBER (before Viterbi BERi) VBER (after Viterbi BERo) UNC (lost packets PER) Link margin	LDPC (BERi) BCH (BERo) PER Link margin
Modulation Error rate	5 - 35 dB	5 - 35 dB	20 - 40 dB	20 - 40 dB	20 - 35 dB	0 - 20 dB	
MER per carrier	yes	yes	-	yes	-		
Symbol rate	-	-	1 to 7.224 Ms/s (J.83A)	-	1 to 5.563 MS/s	1 to 45 MS/s	1 to 45 MS/s
Bandwidth	5, 6, 7, 8 MHz	1.7, 5, 6, 7, 8 MHz	-	6, 8 MHz	-	-	-
Mode	-	SISO, MISO, PLP simple or multiple	-	PLP simple or multiple data slice	-	-	-
FET size	2k and 8k, auto and manual	1k, 2k, 4k, 8k, 16k and 32k + band-width extension, auto	-	4k	-	-	-
Constellation	QPSK, 16 and 64QAM, auto	QPSK, 16, 64 and 256QAM, auto	16, 32, 64, 128 and 256QAM	16,64, 256, 1024, 4096QAM	64, 256QAM	QPSK	QPSK, 8PSK, 16 APSK, 32 APSK
Code rate	1/2, 2/3, 3/4, 5/6, 7/8 (auto)	1/2, 3/5, 2/3, 3/4, 4/5, 5/6 (auto)	-	2/3, 3/4, 4/5, 5/6, 8/9, 9/10	-	1/2, 2/3, 3/4, 5/6, 6/7, 7/8 (auto)	2/5, 1/2, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (auto)
Guard interval	auto and manual	auto	-	auto	-	-	-
Inverted spectrum	auto	auto	auto	auto	auto	auto	auto
HP/LP	yes	-	-	-	-	-	-
PLP choice	-	yes	-	yes	-	-	-
Multistream	-	-	-	-	-	-	yes, PL descrambling
Standards	ETS 301-701	ETS 302-755	ITU J83-AppendixA	ETS 302-769	ETS 302-769	ETS 300-421	ETS 302-307
Pre-echoes / Echoes / Impulse response							
Dynamic range	30 dB, 75km (en 8k)	50 dB, -75km +75km (en 8k)		50 dB, -5km +5km		-	-
Units	µs, km, miles	µs, km, miles		µs, km, miles		-	-
Constellation diagramm	yes	yes	yes	yes	yes	yes	yes

Technical data for SPAROS 808 Touch

	Terrestrial band	Satellite band
Spectrum anallysis		
Span	1MHz to full span in 1, 2, 5 sequences	
Sweep time	100ms mini, 500 ms maxi	
Filters (automatic with selected span)	1,25k, 2,5k, 6,25k, 12,5k, 25k, 62,5k, 125k, 250k, 625kHz, 1,25MHz, 2,5MHz	
Attenuator	automatic or manual (0 to 50 dB with 10 dB steps)	
Dynamic (display)	60 dB (10 dB/div)	
With NIT (OSD) and TV picture	yes	
Measurement map		
Capacity	scrolling of 100 programs maximum	
Display	graphical (bargraph), tilt measurement	
Antenna Check mode		
Goal	fast antenna pointing	fast antenna pointing, single or double LNB
Places/Satellites	30 places typical	30 satellites typical, with European database loaded
NIT check	yes ckeck 4 channels per place, can be modified by user	yes ckeck 4 channels per place, can be modified by user
Signal Monitoring		
Measurements	all, level and digital measurements	
Duration	10 min, 60 min, 8h, 24h, 7d	
Memory		
Saving	internal non volatile memory, or USB memory stick (not supplied)	
Data	places, measure (level, BER/MER, frequency map, spectrums,...)	
Capacity	512 Kb (1000 files or folders max.)	
TV picture and sounds		
Analog programs	PAL, SECAM, NTSC	
Digital programs	MPEG2, MPEG4, HEVC, SD and HD definition	
Sounds	MPEG-1, MPEG-2, AAC, HE AAC, Dolby® Digital, Dolby® Digital Plus	
Encrypted programs *	yes	
RF input		
Input	75 Ohm, F and BNC with adapter supplied	
Max. permissive voltage	50 Vrms /50Hz	
Remote supply and control		
Voltage	5V / 13V / 18V / 24V , 500 mA max (300mA for 24V)	13/18 V, 500 mA max
DiSEqC	-	DiSEqC 1.2, dish rotor control, committed & uncommitted switches
Mini DiSEqC (22kHz)	-	22 kHz, ToneBurst
SatCR	-	DiSEqC protocol extension, control of 8 slots max.
DCSS	-	SatCR protocol extension, control of 32 slots max.
Aux Input/output		
Interfaces	USB A, Ethernet 10baseT (RJ45)	
Power supply input	jack 5.5 mm, 15 V max, 5 A max	
Audio / Video	HDMI output 720p, A/V jack for analog video input and earphones output	

Technical data for SPAROS 808 Touch

	Terrestrial band	Satellite band
ASI		
Functions	ASI input and output TS MPEG	
Frequency	270 MHz, 188/204 bytes, useful bit rate 70Mbit/s max	
Connector	BNC 75 Ohm	
WI-Fi		
Functions	Wi-Fi network level measurement, SSID	
Frequency	2,4 and 5GHz	
WiFi antenna input	SMA reverse 50 Ohm, antenna	
IPTV		
Functions	Streaming TV, network measurement (IAT,...)	
Connector	RJ45 Ethernet 10/100/1000 Mbps	
Protocol	UDP/RTP protocol	
Transmission	Multicast, IGMP, SMPTE-2022	
General specifications		
Display	10.1 inches color LCD 16/9, backlight 500 cd/m^2, 1280x800 dots, capacitive touch pad	
Power supply	main adapter 110/230 VAC, jack with 5,5mm diameter, 15 V/5 A	
Battery (non removable)	LiOn battery 100W	
Autonomy	4 hours typical	
Built-in charger	1 hour charging time for 80% capacity	
Operating temperature	-5°C to 45°C	
Storage temperature	-10°C to 60°C	
EMC and safety	NF-EN 61362-1 / NF-EN 61326-3 / NF-EN 61010-1	
Dimensions	310 x 210 x 80 mm	
Weight	2,8 kg (battery and pouch included)	

(*): the display of digital encrypted programs is possible, if user has a valid subscription card and if the encryption type is supported by the TV meter.

Technical data for SPAROS 800 Touch

	Terrestrial band					Satellite band	
Frequency							
Range	5 ... 1005 MHz					900 ... 2200 MHz	
Resolution	measurement: 50 kHz, display: 1 kHz					measurement: 1MHz, display: 1MHz	
Level measurements							
Dynamic range	20 ... 120 dBµV					20 ... 120 dBµV	
Noise floor level	10 dBµV typical					20 dBµV typical	
Units	dBµV, dBmV, dBm					dBµV, dBmV, dBm	
Accuracy	± 2 dB +/- 0.05 dB /°C					± 2 dB +/- 0.05 dB /°C	
Resolution	0.1 dB					0.1 dB	
Measurement filters	25 kHz					125 kHz	
Standards	BG, DK, I, L, MN, FM, DAB/DAB+, Porteuse, DVB-T/T2/T2lite, DVB-C/C2, J83B					PAL, SECAM, NTSC, Porteuse, DVB-S/S2, DSS	
Measurements	RF, C/N, V/A					RF, C/N	
Numerical measurements	DVB-T/H	DVB-T2/T2lite	DVB-C	DVB-C2	J83B	DVB-S; DSS	DVB-S2
Bit Error rate	CBER (before Viterbi BERi) VBER (after Viterbi BERo) UNC (lost packets PER) Noise margin	LDPC (BERi) BCH (BERo) PER (frame error PER) Noise margin	BER (before Reed Solomon BERi) UNC (lost packets PER) Noise margin	BER (before Reed Solomon BERi) UNC (lost packets PER) Noise margin	BER (after Reed Soloman BERo) UNC (lost packets PER) Noise margin	CBER (before Viterbi BERi) VBER (after Viterbi BERo) UNC (lost packets PER) Link margin	LDPC (BERi) BCH (BERo) PER Link margin
Modulation Error rate	5 - 35 dB	5 - 35 dB	20 - 40 dB	20 - 40 dB	20 - 35 dB	0 - 20 dB	
MER per carrier	yes	yes	-	yes	-		
Symbol rate	-	-	1 to 7.224 Ms/s (J.83A)	-	1 to 5.563 MS/s	1 to 45 MS/s	1 to 45 MS/s
Bandwidth	5, 6, 7, 8 MHz	1.7, 5, 6, 7, 8 MHz	-	6, 8 MHz	-	-	-
Mode	-	SISO, MISO, PLP simple or multiple	-	PLP simple or multiple data slice	-	-	-
FET size	2k and 8k, auto and manual	1k, 2k, 4k, 8k, 16k and 32k + band-width extension, auto	-	4k	-	-	-
Constellation	QPSK, 16 and 64QAM, auto	QPSK, 16, 64 and 256QAM, auto	16, 32, 64, 128 and 256QAM	16,64, 256, 1024, 4096QAM	64, 256QAM	QPSK	QPSK, 8PSK, 16 APSK, 32 APSK
Code rate	1/2, 2/3, 3/4, 5/6, 7/8 (auto)	1/2, 3/5, 2/3, 3/4, 4/5, 5/6 (auto)	-	2/3, 3/4, 4/5, 5/6, 8/9, 9/10	-	1/2, 2/3, 3/4, 5/6, 6/7, 7/8 (auto)	2/5, 1/2, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (auto)
Guard interval	auto and manual	auto	-	auto	-	-	-
Inverted spectrum	auto	auto	auto	auto	auto	auto	auto
HP/LP	yes	-	-	-	-	-	-
PLP choice	-	yes	-	yes	-	-	-
Multistream	-	-	-	-	-	-	yes, PL descrambling
Standards	ETS 301-701	ETS 302-755	ITU J83-AppendixA	ETS 302-769	ETS 302-769	ETS 300-421	ETS 302-307
Pre-echoes / Echoes / Impulse response							
Dynamic range	30 dB, 75km (en 8k)	50 dB, -75km +75km (en 8k)		50 dB, -5km +5km		-	-
Units	µs, km, miles	µs, km, miles		µs, km, miles		-	-
Constellation diagramm	yes	yes	yes	yes	yes	yes	yes

Technical data for SPAROS 800 Touch

	Terrestrial band	Satellite band
Spectrum anallysis		
Span	1MHz to full span in 1, 2, 5 sequences	
Sweep time	100ms mini, 500 ms maxi	
Filters (automatic with selected span)	1,25k, 2,5k, 6,25k, 12,5k, 25k, 62,5k, 125k, 250k, 625kHz, 1,25MHz, 2,5MHz	
Attenuator	automatic or manual (0 to 50 dB with 10 dB steps)	
Dynamic (display)	60 dB (10 dB/div)	
With NIT (OSD) and TV picture	yes	
Measurement map		
Capacity	scrolling of 100 programs maximum	
Display	graphical (bargraph), tilt measurement	
Antenna Check mode		
Goal	fast antenna pointing	fast antenna pointing, single or double LNB
Places/Satellites	30 places typical	30 satellites typical, with European database loaded
NIT check	yes ckeck 4 channels per place, can be modified by user	yes ckeck 4 channels per place, can be modified by user
Signal Monitoring		
Measurements	all, level and digital measurements	
Duration	10 min, 60 min, 8h, 24h, 7d	
Memory		
Saving	internal non volatile memory, or USB memory stick (not supplied)	
Data	places, measure (level, BER/MER, frequency map, spectrums,...)	
Capacity	512 Kb (1000 files or folders max.)	
TV picture and sounds		
Analog programs	PAL, SECAM, NTSC	
Digital programs	MPEG2, MPEG4, HEVC, SD and HD definition	
Sounds	MPEG-1, MPEG-2, AAC, HE AAC, Dolby® Digital, Dolby® Digital Plus	
Encrypted programs *	yes	
RF input		
Input	75 Ohm, F and BNC with adapter supplied	
Max. permissive voltage	50 Vrms /50Hz	
Remote supply and control		
Voltage	5V / 13V / 18V / 24V, 500 mA max (300mA for 24V)	13/18 V, 500 mA max
DiSEqC	-	DiSEqC 1.2, dish rotor control, committed & uncommitted switches
Mini DiSEqC (22kHz)	-	22 kHz, ToneBurst
SatCR	-	DiSEqC protocol extension, control of 8 slots max.
DCSS	-	SatCR protocol extension, control of 32 slots max.
Aux Input/output		
Interfaces	USB A, Ethernet 10baseT (RJ45)	
Power supply input	jack 5.5 mm, 15 V max, 5 A max	
Audio / Video	HDMI output 720p, A/V jack for analog video input and earphones output	

Technical data for SPAROS 800 Touch

	Terrestrial band	Satellite band
General specifications		
Display	10.1 inches color LCD 16/9, backlight 500 cd/m², 1280x800 dots, capacitive touch pad	
Power supply	main adapter 110/230 VAC, jack with 5,5mm diameter, 15 V/5 A	
Battery (non removable)	LiOn battery 100W	
Autonomy	4 hours typical	
Built-in charger	1 hour charging time for 80% capacity	
Operating temperature	-5°C to 45°C	
Storage temperature	-10°C to 60°C	
EMC and safety	NF-EN 61362-1 / NF-EN 61326-3 / NF-EN 61010-1	
Dimensions	310 x 210 x 80 mm	
Weight	2,8 kg (battery and pouch included)	

(*): the display of digital encrypted programs is possible, if user has a valid subscription card and if the encryption type is supported by the TV meter.

CALYPSO SOTx and CALYPSO SORx

... comming soon!

- 16 SAT IF signals and terrestrial on one optical fibre
- 12V external operating voltage

TV Signal Analyzer

DVB-S/S2 SAT

DVB-C/C2 Cable

DVB-T/T2/H Terrestrial

TV picture HDTV

7“ LCD touch display for a comprehensive display of measurement data.

SPAROS 777 Touch
Art. No.: 850032

Features:

- All modulation types DVB-S/S2, DVB-C/C2 and DVB-T/T2 are supported.
- Operation with a 7“ LCD touch screen.
- Split screen for the simultaneous figure of measurements and spectrum.
- Powerful lithium-ion battery with a duration of up to 2 hours.
- TV picture mode for digital (MPEG4 - H.264 and MPEG2) FTA TV programs.
- Fast spectrum analyses.
- CheckSAT mode with NIT analyses.
- Constellation diagram for all digital types of modulation.
- Real time echoes and pre-echoes measurement in DVB-T/T2 modulation.
- Ethernet and USB interface.
- DiSEqC and SCR(EN 50494 & EN 50607) support.

Included in scope of delivery:

- **SPAROS 777 TV Signal Analyzer**
- Protection lid
- AC / DC power unit
- Supplied in a metal transport case.
- USB stick with an extensive operating manual (PDF)

Home

Extensive depiction of the various menu items

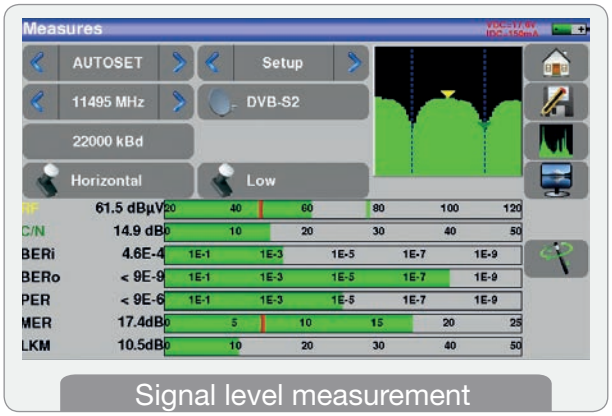
The home screen displays an overview of various menu items, which may then be selected directly.
This enables the user to operate the measurement device easily.

Home

Signal level measurement

Extensive depiction of the measurement results

SPAROS provides the measurement clearly laid out and logically on the 7“ LCD touchscreen. All measurement values are provided to the user at a glance. Level, C/N, bit error rate before and after the correction, lost data packets, and the MER, off course. The system reserve of the system is displayed via the measurement value LKM. Furthermore, the spectrum of the selected measuring transponder is shown in the display. With the help of the „auto lock“ function, the user is able to check the correct symbol rate and modulation type of the measurement device if they need to see this again.

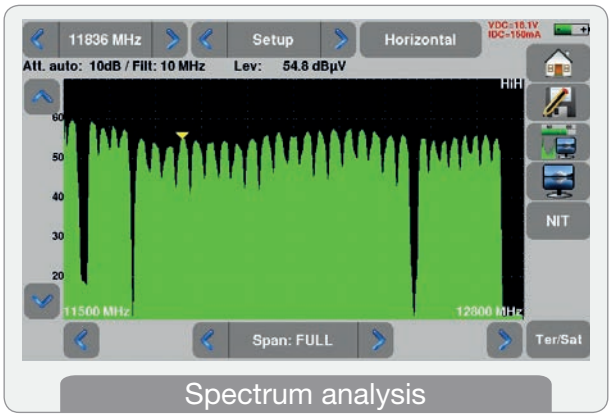


Signal level measurement

Spectrum analysis

Graphic depiction of the signal

Using the spectrum analysis is an extremely helpful function for set-up and troubleshooting within a receiver system. Either the complete bandwidth of the signal or just a certain part of the signal may be viewed here. Different pre-defined zoom factors enable various bandwidths for viewing the signal. This applies to the terrestrial frequency range and for the SAT IF range.



Spectrum analysis

Autoscan

Automatic channel search

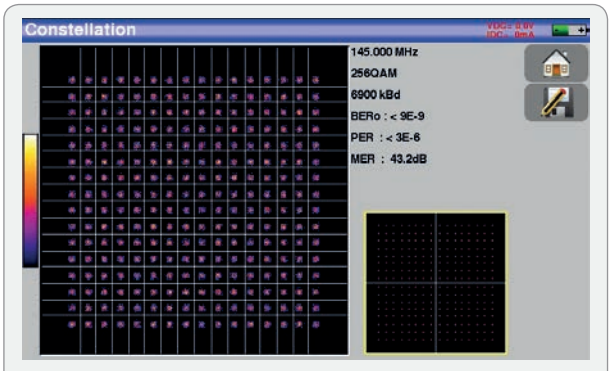
The autoscan menu function enables an automatic channel search in the receiver system. After the receiver parameters have been specified by the user, the measurement device only searches for channels that meet the user's specifications. After the search is completed, all of the frequencies detected are saved and are available at any time for measurements.

Autoscan

Constellation diagram

Graphic depiction of the digital information

The constellation diagram shows the digital signals graphically across a specific period of times. If no transmission errors are present, the data are recognised by the measurement device without any problems and then appear in the diagram as defined points in the corresponding quadrants.
Transmission errors cause the points to be „scattered" around the centre and not displayed in the centre of the quadrants. The density of the points is displayed via various colours.

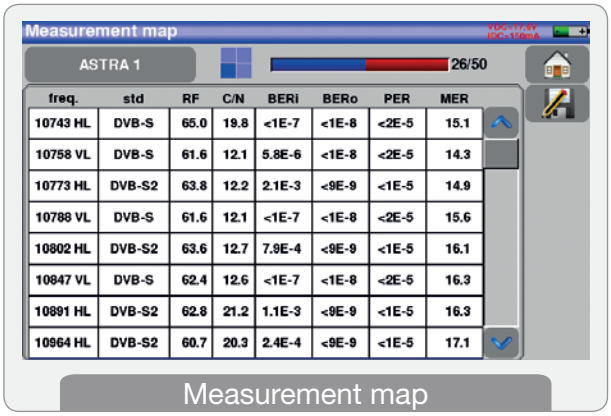


Constellation diagram

Measurement map

Automatic detection of measurement values

The measurement plan function enables measurement values to be provided for documentation within a receiver system reliably, quickly, and easily. SPAROS scans all of the measurement frequencies of the selected memory bank, and the user has the option of saving measurement values internally. Naturally, the user may give any measurement a unique name to access the correct measurement data quickly later. If the measurement data supports multiple frequency ranges, then it is also possible, for example, to create a measurement plan that includes SAT IF transponder data and DVB-T frequencies.



freq.	std	RF	C/N	BERi	BERo	PER	MER
10743 HL	DVB-S	65.0	19.8	<1E-7	<1E-8	<2E-5	15.1
10758 VL	DVB-S	61.6	12.1	5.8E-6	<1E-8	<2E-5	14.3
10773 HL	DVB-S2	63.8	12.2	2.1E-3	<9E-9	<1E-5	14.9
10788 VL	DVB-S	61.6	12.1	<1E-7	<1E-8	<2E-5	15.6
10802 HL	DVB-S2	63.6	12.7	7.9E-4	<9E-9	<1E-5	16.1
10847 VL	DVB-S	62.4	12.6	<1E-7	<1E-8	<2E-5	16.3
10891 HL	DVB-S2	62.8	21.2	1.1E-3	<9E-9	<1E-5	16.3
10964 HL	DVB-S2	60.7	20.3	2.4E-4	<9E-9	<1E-5	17.1

Measurement map

Image display

Visual depiction of a TV program

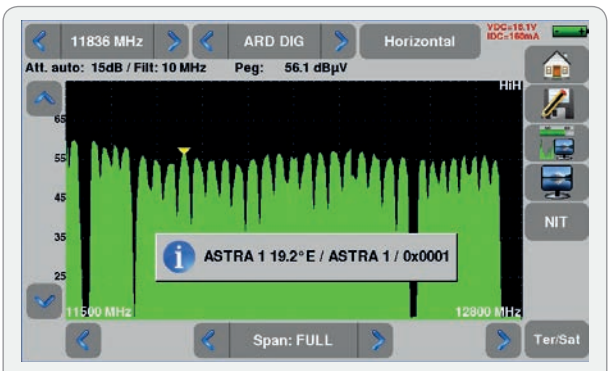
The 7“ 16:9 LCD colour display is provided for optimal display of the image. The measurement device enables image display of freely receivable digital programs in the standard MPEG2 (SD) and MPEG4 (HD).

Image display

NIT evaluation

Fast SAT antenna alignment check

The user has the option of evaluating the NIT within the spectral analysis. In addition to this, the cursor must be placed on the tip of a digital transponder. Next, press the NIT button, and the measurement device checks the transmitted NIT information automatically and then displays it visually.

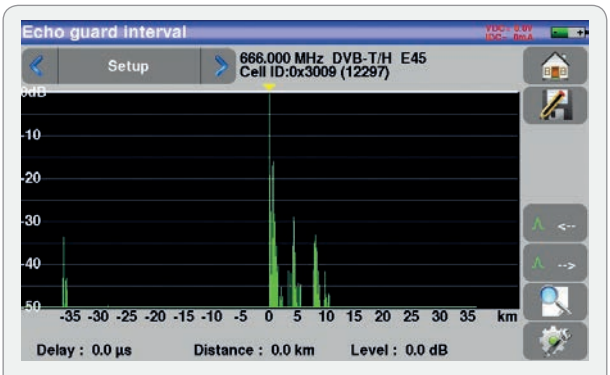


NIT evaluation

Echo measurement

Alignment of DVB-T antennas

With the help of this menu, the user can align a DVB-T antenna quickly and reliably. Due to the multipath reception of DVB-T transmission, the antenna must be aligned at the receiving location so that the reflections do not impair reception. The echo measurement supports the user in this case.

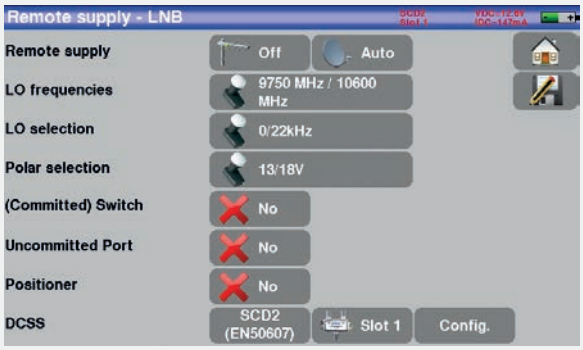


Echo measurement

Remote supply voltage

Setting the reception parameters

The remote supply voltage menu enables the user to set the SPAROS specifically according to the environment of the receiver device. In the SAT range, DiSEqC is supported for reception up to 64 positions. Of course, SCR (single-cable commands) remains as per EN 50494 and the new standard EN 50607 (SCD2). For the terrestrial range, pre-defined direct voltages between 5 and 24 volts are available.

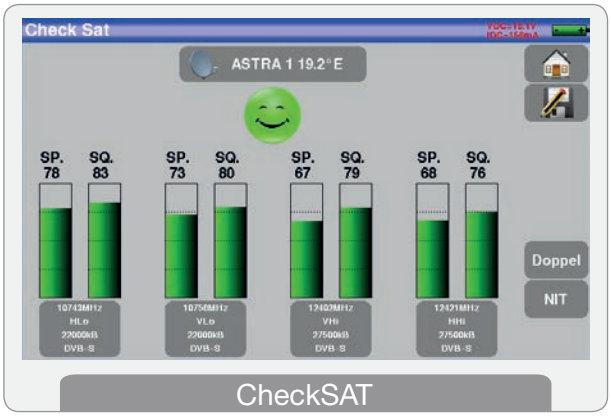


Remote supply voltage

CheckSAT

Alignment of antenna reflectors

The CheckSat function helps during the initial rough alignment of the satellite antenna. In this case, the signal strength and the signal quality are evaluated by four defined measurement transponders for an orbit position and displayed. If all 4 transponders are available, then the user can be sure that the antenna reflectors are aligned with the right orbit position. Follow-up fine adjustments may still be made via the MER.



CheckSAT

Configuration

Basic setting of the measurement device

The configuration menu provides the user access to various settings of the measurement device. Various settings options are available, e.g. setting the menu language, IP settings, and firmware updates.

Configuration

Technical data SPAROS 777

Technical data	Terrestrial band	Satellite band
Frequencies		
Range	5-900 MHz	900-2200 MHz
Resolution	measure 50 kHz, display 1 kHz	measure 1MHz, display 1MHz
Level measurements		
Dynamic range	20-120 dBµV (30-120 dBµV for 5-45MHz)	30-110 dBµV
Noise floor level	10 dBµV typical	20 dBµV typical
Units	dBµV	
Accuracy	±2dB +/- 0.05dB/°C	
Resolution	0,1dB	
Measurement filters	100KHz - 300 kHz - 1MHz	1MHz - 3MHz - 10MHz
Standards	DVB-C/C2, DVB-T/T2/T2lite BG, DK, I, L, MN, carrier	DVB-S/S2, DSS PAL, SECAM, NTSC
Mesures	RF level/power, C/	
Spectrum Analyser		
Fast Mode	350 ms typ. (3 times/s)	
Filters (according to span)	100kHz, 300kHz, 1 MHz	1MHz - 3MHz - 10MHz
Attenuator	automatic or manual (0 to 55 dB with 5 dB step)	
Dynamic range (display)	60 dB (10 dB/div)	
Span	5MHz à full span 1, 2, 5 step	
Pre-echos /Echos DVBT/T2		
Dynamic range	DVB-T : 50 dB, -75km +75km (8k) DVB-T2 : 50 dB, -75km +75km (8k) DVB-C2 : 50 dB, -35km +35km (4k)	
Units	µs, km, miles	
Constellation display		
	yes, standards DVB-T/T2, DVB-C/C2, DVB-S/S2, DSS	
Measurement Map		
Capacity	scanning of 50 setups maximum	
Display	Texte table	
TV MPEG		
Digital Multiplex (not coded)	MPEG2 SD (standard definition) MPEG4 HD (high definition H.264)	
Service table DVB-SI	SDT, LCN	
Sound	MPEG-1, MPEG-2, AAC, HE AAC, Dolby® Digital, Dolby® Digital Plus	
DVB-T/H		
Bit Error Rate (BER)	CBER (before Viterbi BERi) VBER (after Viterbi BERo) UNC (lost packets PER) Noise margin	
Modulation Error Rate (MER)	5 - 35dB	
Bandwidth	6MHz, 7 MHz, 8 MHz	
FFT type	2k, 8k, auto	
Constellation	QPSK, 16QAM, 64QAM, auto	
Viterbi rate	1/2, 2/3, 3/4, 5/6, 7/8, auto	
Guard interval	auto, manual	
Spectrum inversion	auto	
HP/LP – PLP – Data Slice	HP/LP	
Standards	ETS 300-744	

Technical data SPAROS 777

Technical data	
DVB-T2 / T2 Lite	
Bit Error Rate (BER)	LDPC (BERi) BCH (BERo) FER (frame error PER) Noise margin
Modulation Error Rate (MER)	5 - 35dB
Bandwidth	1.7MHz, 5MHz, 6MHz, 7 MHz, 8 MHz
Mode	SISO, MISO, PLP single or multiple
FFT type	1k, 2k, 4k, 8k, 16k, 32k + extended bandwidth, auto
Constellation	QPSK, 16QAM, 64QAM, 256QAM, auto
Viterbi rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 1/3, 2/5, auto
Guard Interval	auto
Spectrum inversion	auto
HP/LP – PLP – Data Slice	PLP
Standards	ETS 302-755
DVB-C J83A	
Bit Error Rate (BER)	BER (before Reed Solomon BERo) UNC (lost packets PER) Noise margin
Modulation Error Rate (MER)	20 - 40dB
Symbol Rate	1 to 7.224 Ms/s
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Spectrum inversion	auto
Standards	ETS 300-429
DVB-C2	
Bit Error Rate (BER)	LDPC (BERi) BCH (BERo) FER (frame error PER) Noise margin
Modulation Error Rate (MER)	5 - 35dB
Symbol Rate	-
Bandwidth	6MHz, 8 MHz
Mode	PLP and data slice, single or multiple
FFT type	4k
Constellation	16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM, auto
Viterbi rate	2/3, 3/4, 4/5, 5/6, 8/9, 9/10
Guard Interval	auto
Spectrum inversion	auto
HP/LP – PLP – Data Slice	PLP+Data Slice
Standards	ETS 302-769
DVB-S, DSS	
Bit Error Rate (BER)	CBER (before Viterbi BERi) VBER (after Viterbi BERo) UNC (lost packets PER) Link margin
Modulation Error Rate (MER)	0 - 20dB
Symbol Rate	1 to 45Ms/s
Constellation	QPSK
Viterbi rate	1/2, 2/3, 3/4, 5/6, 6/7, 7/8, auto
Spectrum inversion	auto
Standards	ETS 300-421

Technical data SPAROS 777

Technical data		
DVB-S2		
Bit Error Rate (BER)	LDPC (BERi) BCH (BERo) PER Link margin	
Modulation Error Rate (MER)	0 - 20dB	
Symbol rate	1 to 45Ms/s	
Constellation	QPSK, 8PSK, 16APSK, 32APSK	
Modulation	CCM, VCM, ACM	
Multistream	stream select ISI 0-99, PL scrambling (Gold code)	
Viterbi rate	2/5, 1/2, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10, auto	
Spectrum inversion	auto	
Standards	ETS 302-307	
Remote supply	**Terrestrial**	**Satellite**
Voltage	5 V / 13 V / 18 V / 24 V 500 mA max (300mA für 24 V)	13 / 18 V 500 mA max
DiSEqC	-	DiSEqC 1.2 control of dish motor committed & uncommitted switches
Mini DiSEqC (22kHz)	-	22 kHz, ToneBurst
SCD /SATCR EN 50494 Single cable satellite distribution	-	8 slots max switch committed
SCD2 EN 50607 Single cable satellite distribution v2	-	32 slots max switchs committed & uncommitted code PIN
Storage		
Memory	Internal on non-volatile memory, or external USB stick (not supplied)	
Data saved	measurements (level, BER/MER, Measurement Maps, Spectrum,…)	
Capacity	512 Ko (about 150 files)	
Inputs / Outputs		
RF input	75 Ohm, F (with adapter)	
Max permitted voltage	48V RMS / 50Hz	
Interfaces	USB A, USB mini B, Ethernet 10baseT (RJ45)	
DC supply input	jack 5.5 mm 15 V max, 5 A max	
Operating temperature	-5° ... 45 °C	
Dimensions (mm)	250 x 185 x 65	
Weight	1,3 kg without carrying strap	

Accessories

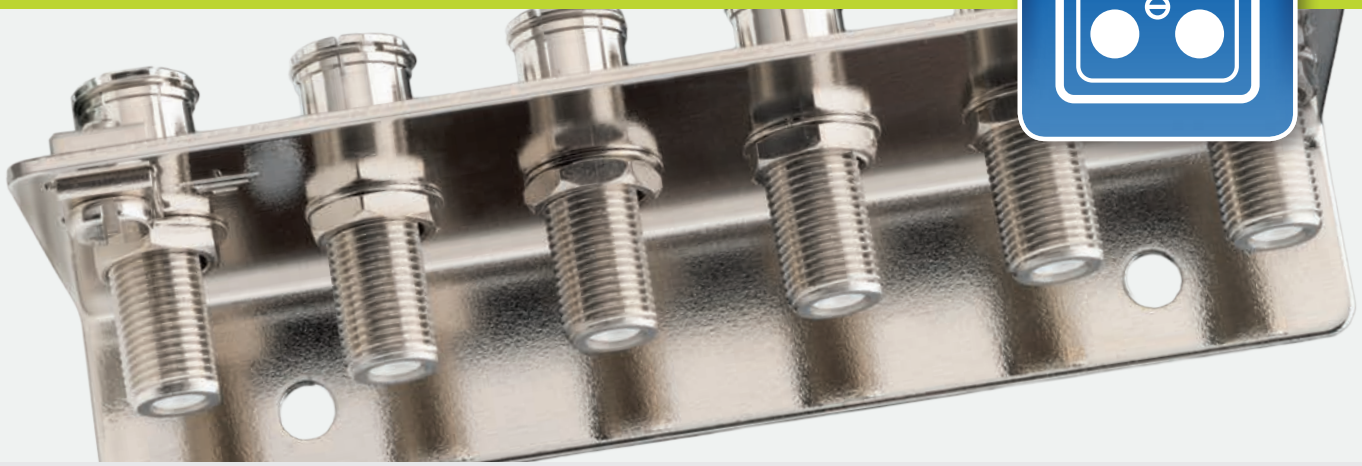


TABLE OF CONTENTS

Universal AC Adapter

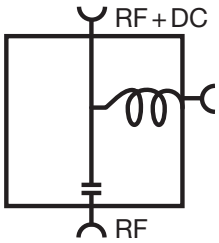
SNG 18/1000
SNG 19/1000

To power SPAUN devices which are designed for an external power supply.

- International adapters.

Model Art. No.	SNG 18/1000 832114	SNG 19/1000 832118
EAN	4040326321140	4040326321188
Mains power supply U ~	100 - 240 V 50/60Hz	100 - 240 V 50/60Hz
No load power consumption	max. 0,3 W	max. 0,3 W
Output voltage	max. 18 V / 1 A	max. 19 V / 1 A
Connector type	F connector	F connector
Ambient temperature	0 ... 40 °C	0 ... 40 °C

Line Power Injection Filter



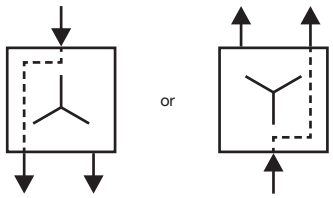
FSW 40 F

To add or remove remote power.

Applications:
- For remote powering of SAT / CATV devices.
- To bypass non DC resistant RF components.

Model Art. No.	FSW 40 F 871333
EAN	4040326713334
Frequency range	5 ... 2200 MHz
Through loss	1 dB
Remote power voltage	max. 20 V / 1 A
Ambient temperature	-20 ... +50 °C
Dimensions (mm)	40 x 74 x 21

Diplexer



SEW 123 F

- To combine/separate the terrestrial and SAT IF signals.
- DC pass for LNB remote power.

Model Art. No.	SEW 123 F 871109
EAN	4040326711095
Frequency range	5 … 862 MHz 950 … 2400 MHz
Through loss SAT terrestrial	1.5 dB 0,5 … 2 dB
Rejection terrestrial/SAT SAT/terrestrial	typ. 30 dB typ. 30 dB
DC pass	max. 20 V / 1A
Ambient temperature	-20 … +50 °C
Dimensions (mm)	52 x 53 x 17

DiSEqC Generator

SUG 22

- To convert the standard switching commands (14/18 V, 0/22 kHz) into DiSEqC 1.0 commands.
- To be fitted into receiver downlead cable.
- Enable the access to 4, 8, 12 or 16 SAT IF polarities in combination with DiSEqC switches.
- Last switching state is maintained even after switch off the device.

Model Art. No.	SUG 22 871400
EAN	4040326714003
Frequency range	950 … 2200 MHz
RF input/RF output	1/1
Through loss	2,5 dB
Supply voltage	12 ... 18 V
Power consumption	< 50 mA
Push button	S1 = Band/S2 = Polarisation/ S3 = Position/S4 = Option
LEDs	LED1 = Band/LED2 = Polarisation/ LED3 = Position/LED4 = Option
Dimensions (mm)	76 x 36 x 27

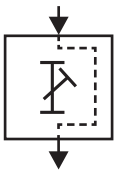
22 kHz Generator

SGS 22 F

- To generate a continuous 22 kHz tone.

Model Art. No.	SGS 22 F 821003
EAN	4040326210031
Frequency range	950 … 2200 MHz
Through loss	typ. 2 dB
Supply voltage	max. 10 … 20 V / 20 mA
DC pass	max. 20 V / 500mA
Ambient temperature	-20 … +50 °C
Dimensions (mm)	80 x 26,5 x 16,5

Level Adjuster

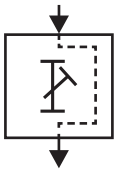


PS 2200 FI

- To attenuate RF levels.

Model Art. No.	PS 2200 FI 871399
EAN	4040326713990
Frequency range	5 … 2300 MHz
Through loss terrestrial	typ. 0,5 dB
Through loss SAT	typ. 1 … 3 dB
Attenuation range	-1 … -20 dB
DC pass	max. 20 V / 1A
Ambient temperatur	-20 … +50 °C
Dimensions (mm)	76 x 36 x 27

Level Adjuster

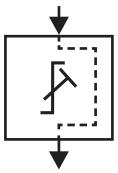


PES 2200 F

- To attenuate RF levels.

Model Art. No.	PES 2200 F 821013
EAN	4040326210130
Frequency range	5…2200 MHz
Through loss terrestrial	typ. 0 ... 4 dB
Through loss SAT	typ. 18 ... 24 dB
Attenuation range	0… 20 dB
DC pass	max. 20 V / 1A
Ambient temperatur	-20…+50 °C
Dimensions (mm)	101 x 38 x 25

SAT Slope Equalizer Unit



SLS 2200 F

- To compensate the slope of distribution networks.

Model Art. No.	SLS 2200 F 821005
EAN	4040326210055
Through loss	typ. 1,5 dB
Loss 950 MHz 2200 MHz	 14 dB 3 dB
Slope control	-1…-12 dB
DC pass	max. 20 V / 1 A
Supply voltage	11…20 V DC / 7 mA
Ambient temperature	-20… +50 °C
Dimensions (mm)	101 x 38 x 25

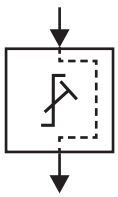
Slope Equalizer for SAT and Terrestrial

LES 2200

- To compensate the slope of distribution networks.

Model Art. No.	LES 2200 821002
EAN	4040326210024
Frequency range	5 … 2200 MHz
Through loss	2 dB
Loss 47 MHz 862 MHz 2200 MHz	 typ. 12 dB typ. 10 dB typ. 2 dB
Slope control (fixed value)	-10 dB
DC pass	max. 20 V / 1 A
Ambient temperature	-20 … +50 °C
Dimensions (mm)	80 x 26,5 x 16,5

Terrestrial Slope Equalizer



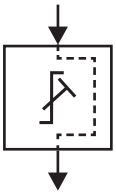
! For DC compatibility use **DCF 500 (Art. Nr. 871506)**

LE 862 FI

- To compensate the slope of distribution networks.

Model Art. No.	LE 862 FI 871322
EAN	4040326713228
Frequency range	47 … 862 MHz
Through loss	typ. 1 dB
Slope control	-1 … -20 dB
Ambient temperature	-20 … +50 °C
Dimensions (mm)	76 x 36 x 27

Terrestrial Slope Equalizer



LEX 862 F

- To compensate the slope of distribution networks.

Model Art. No.	LEX 862 F 821012
EAN	4040326210123
Frequency range	47 … 862 MHz
Through loss	typ. 1 dB
Slope control	-1 … -20 dB
Ambient temperature	-20 … +50 °C
Dimensions (mm)	101 x 38 x 25

Taps

AZR 171170/10 F, AZR 171170/15 F
AZR 172170/10 F, AZR 172170/15 F

- To be used in large distribution networks with multiple trunk lines, these devices reduce the installation cost significantly.
- For each tap series, there are two different models with different tap loss.
- The terrestrial line is return path compatible. The trunk line DC path is linked to the tap outlet.

Model Art. No.		AZR 171170/10 F 841134	AZR 171170/15 F 841135	AZR 172170/10 F 841136	AZR 172170/15 F 841137
EAN		4040326411346	4040326411353	4040326411360	4040326411377
Inputs SAT/terrestrial		16/1			
Outputs SAT/terrestrial		16/1+16/1		16/1+16/1+16/1	
Frequency range		5…862 MHz 16 x 950…2200 MHz			
Tap loss tap 1 terrestrial SAT		11 dB 13…10 dB	15 dB 18…15 dB	10 dB 14…10 dB	15 dB 18…15 dB
Tap loss tap 2 terrestrial SAT		-	-	10 dB 14…10 dB	15 dB 18…15 dB
Through loss trunk terrestrial SAT		3,5 dB 2 dB	2,5 dB 2 dB	4 dB 3 dB	3,5 dB 3 dB
Isolation	Trunk /trunk	typ. 26 dB			
	Trunk /tap	typ. 26 dB			
	Tap/tap	typ. 26 dB			
DC pass		max. 20 V / 1 A			
Ambient temperature		-20… +50 °C			
Dimensions (mm)		426 x 132 x 46			

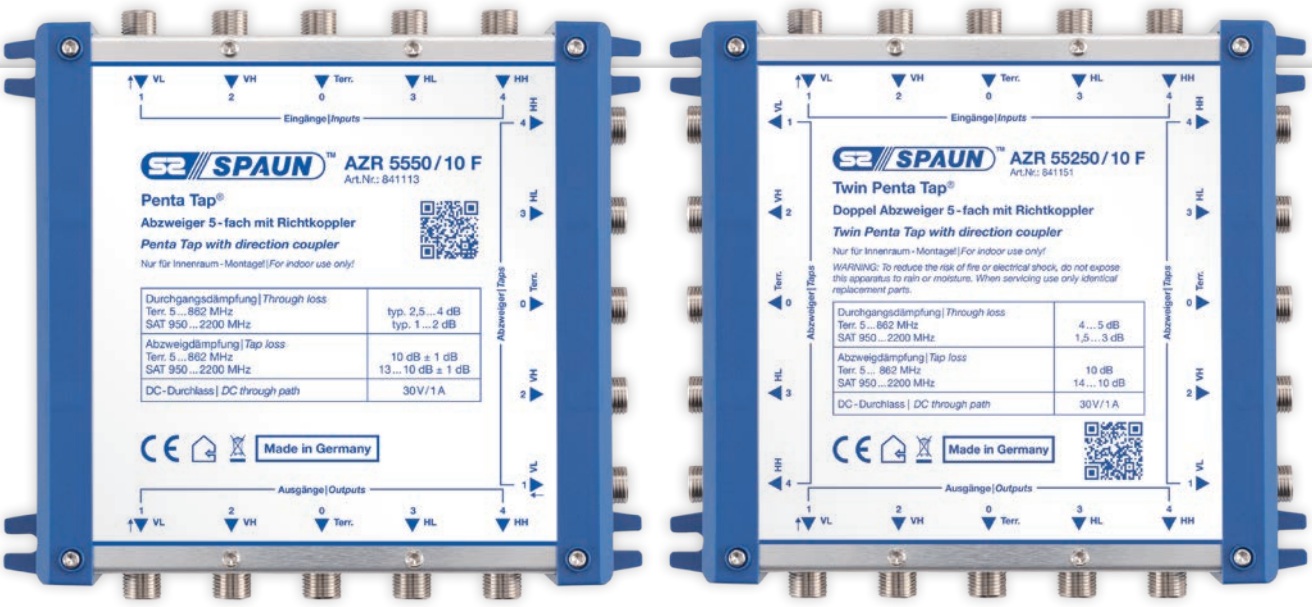
Taps

AZR 9990/10 F, AZR 99290/10 F

- To be used in large distribution networks with multiple trunk lines, these devices reduce the installation cost significantly.
- The terrestrial line is return path compatible. The trunk line DC path is linked to the tap outlet.

Model Art. No.		AZR 9990/10 F 841131	AZR 99290/10 F 841153
EAN		4040326411315	4040326411537
Inputs SAT/terrestrial		8/1	
Outputs SAT/terrestrial		8/1+8/1	8/1+8/1+8/1
Frequency range		5...862 MHz und 8 x 950...2200 MHz	
Tap loss tap 1 terrestrial SAT		10 dB 13...9 dB	10 dB 13...10 dB
Tap loss tap 2 terrestrial SAT		-	10 dB 13...10 dB
Through loss trunk terrestrial SAT		3,5 dB 1...2,5 dB	6 dB 2...4 dB
Isolation	Trunk /trunk	typ. 26 dB	
	Trunk /tap	typ. 26 dB	
	Tap/tap	typ. 26 dB	
DC pass		max. 20 V / 1 A	
Ambient temperature		-20...+50 °C	
Dimensions (mm)		264 x 211 x 39	

Taps



AZR 5550/10 F, AZR 5550/15 F
AZR 5550/20 F AZR 55250/10 F

- The installation expenditure of major distribution networks can be reduced substantially.
- Easy installation, just one device instead of five.
- The trunk line DC path is also linked to the tap outlets. This offers remote power to post amplifiers in tap lines.

Model Art. No.		AZR 5550/10 F 841113	AZR 5550/15 F 841114	AZR 5550/20 F 841115	AZR 55250/10 F 841151
EAN		4040326411131	4040326411148	4040326411155	4040326411513
Inputs SAT/terrestrial		4/1			
Outputs SAT/terrestrial		4/1+4/1			4/1+4/1+4/1
Frequency range		5…862 MHz 4 x 950…2200 MHz			
Tap loss Tap 1 terrestrial SAT		10 dB 13…10 dB	16 dB 19…15 dB	17 dB 24…20 dB	10 dB 14…10 dB
Tap loss Tap 2 terrestrial SAT		-	-	-	10 dB 14…10 dB
Through loss trunk terrestrial SAT		2,5…2 dB 1…2 dB	1…2 dB 1…2 dB	1…1,5 dB 1…2 dB	4…5 dB 1,5…3 dB
Isolation	Trunk /trunk	typ. 26 dB			
	Trunk /tap	typ. 26 dB			
	Tap/tap	typ. 26 dB			
DC pass		max. 20 V / 1 A			
Ambient temperature		-20…+50 °C			
Dimensions (mm)		145 x 130 x 39			

Taps

ABE 1/10 P, ABE 1/15 P, ABE 2/10 P
ABE 2/15 P, ABE 4/10 P, ABE 4/15 P, ABE 6/15 P

- To tap ports from a trunk line.
- CATV compatible.
- Remote power passes only through trunk line.
- Unused trunk line outputs must be terminated.

Model Art. No.	ABE 1/10 P 841138	ABE 1/15 P 841139	ABE 2/10 P 841141	ABE 2/15 P 841142	ABE 4/10 P 841147	ABE 4/15 P 841148	ABE 6/15 P 841150
EAN	4040326411384	4040326411391	4040326411414	4040326411421	4040326411476	4040326411483	4040326411506
Tap	1-way		2-way		4-way		6-way
Tap loss 5…40 MHz 40…1000 MHz 1000…2400 MHz	11 dB 10 dB 10 dB	15 dB 15 dB 15 dB	11 dB 11 dB 11 dB	15 dB 15 dB 15 dB	10,5 dB 11,5 dB 13 dB	15 dB 15 dB 15,5 dB	15,5 dB 16 dB 18 dB
Tap loss trunk 5 ... 40 MHz 40 ... 1000 MHz 1000…2400 MHz	typ. 2,0 dB typ. 2,5 dB typ. 3,2 dB	typ. 1,5 dB typ. 1,5 dB typ. 2,2 dB	typ. 3,5 dB typ. 4,5 dB typ. 4,5 dB	typ. 3 dB typ. 3 dB typ. 4 dB	typ. 5 dB typ. 5 dB typ. 6 dB	typ. 3 dB typ. 3,5 dB typ. 5 dB	typ. 4 dB typ. 4,5 dB typ. 7 dB
DC pass	max. 20 V / 1 A						
Ambient temperature	-20…+50 °C						
Dimensions (mm)	56 x 50 x 28		78 x 50 x 28				122 x 58 x 29

UNiTap

UNiTap

- **Suitable for SCR and dSCR applications.**
- DC pass in all directions.

Model Art. No.	UNiTap 841156
EAN	4040326411568
Tap	1-way
Frequency range	5…2400 MHz
Insertion loss	typ. 2 dB
DC pass	max. 20 V / 1 A
Ambient temperature	-20…+50 °C
Dimensions (mm)	55 x 48 x 27

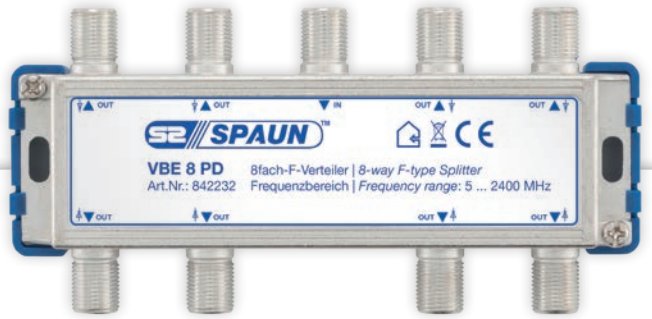
Splitters

VTS 17217, VTS 929, VTS 525, VTS 545

- To be used in large distribution networks with multiple trunk lines, these splitters reduce the installation expenditures substantially. This means the RF signal of the terrestrial trunk line and the 16/8/4 SAT IF trunk lines are divided in each case into two trunk lines. Each trunk line has a separate DC pass, which is connected with the respective output ports.
- **The VTS 545 offers 4 x 5 outputs.**

Model Art. No.		VTS 17217 842222	VTS 929 842221	VTS 525 842218	VTS 545 842235
EAN		4040326422229	4040326422212	4040326422182	4040326422359
Inputs SAT/terrestrial		16/1	8/1	4/1	4/1
Outputs SAT/terrestrial		16/1+16/1	8/1+8/1	4/1+4/1	4 x 4/1
Frequency range		5…862 MHz and 950…2200 MHz			
Through loss terrestrial SAT		typ. 4 dB typ. 5 dB			typ. 7,5 dB typ. 8,5 dB
Isolation	Input/input	typ. 26 dB			typ. 35 dB
	Output/output terrestrial	typ. 20 dB			typ. 25 dB
	Output/output SAT	typ. 15 dB			typ. 18 dB
DC pass		max. 20 V / 1 A			
Ambient temperature		-20…+50 °C			
Dimensions (mm)		426 x 132 x 46	264 x 211 x 39	145 x 130 x 46	305 x 130 x 40

Splitters



VBE 2 P, VBE 4 P
VBE 2 PD, VBE 3 PD, VBE 4 PD, VBE 6 PD, VBE 8 PD

- To split signals into 2 - 8 outputs.
- CATV compatible.
- DC pass from all output ports via diodes.
- **Feature VBE 2 P and VBE 4 P: Remote power pass in all directions.**

Model Art. No.	VBE 2 P 842223	VBE 4 P 842234
EAN	4040326422236	4040326422342
Splitter	2 - way	4 - way
Through loss 5 ... 40 MHz 40 ... 1000 MHz 1000 ... 2400 MHz	 4,5 dB 4,5 dB 5 dB	 8,5 dB 9 dB 11 dB
Return loss 5 ... 40 MHz 40 ... 1000 MHz 1000 ... 2400 MHz	 typ. 18 dB typ. 20 dB typ. 20 dB	 typ. 22 dB typ. 20 dB typ. 20 dB
DC pass	max. 20 V / 1 A	
Ambient temperature	-20 ... +50 °C	
Dimensions (mm)	56 x 50 x 28	78 x 50 x 28

Model Art. No.	VBE 2 PD 842224	VBE 3 PD 842226	VBE 4 PD 842228	VBE 6 PD 842230	VBE 8 PD 842232
EAN	4040326422243	4040326422267	4040326422281	4040326422304	4040326422328
Splitter	2 - way	3 - way	4 - way	6 - way	8 - way
Through loss 5 ... 40 MHz 40 ... 1000 MHz 1000 ... 2400 MHz	 4,5 dB 5 dB 6,2 dB	 7,5 dB 8 dB 10,5 dB	 8,5 dB 9 dB 11 dB	 11,5 dB 13 dB 16,5 dB	 12 dB 14 dB 16 dB
Return loss 5 ... 40 MHz 40 ... 1000 MHz 1000 ... 2400 MHz	 typ. 18 dB typ. 20 dB typ. 20 dB	 typ. 20 dB typ. 20 dB typ. 20 dB	 typ. 22 dB typ. 20 dB typ. 20 dB	 typ. 22 dB typ. 20 dB typ. 20 dB	 typ. 22 dB typ. 20 dB typ. 20 dB
DC pass	max. 20 V / 1 A				
Ambient temperature	-20 ... +50 °C				
Dimensions (mm)	56 x 50 x 28	78 x 50 x 28		122 x 58 x 29	

TV Socket Outlets (CATV)

ASE 203, ASD 210
ASD 214, ASD 218

- To be used in CATV networks or terrestrial distribution systems.
- The products are equipped with screw and claws fastening, suitable for flush-mounted installation boxes with a diameter of 55 mm.
- The antenna sockets can be combined with almost all installation programs.
- Delivery is without cover plate.

Model Art. No.	ASE 203 850016	ASD 210 821104	ASD 214 821105	ASD 218 821106
EAN	4040326500163	4040326211045	4040326211052	4040326211069
Type	Stubline Socket	Through Socket	Through Socket	Through Socket
Frequency range TV	5…862 MHz			
Frequency range FM	87,5...230 MHz			
Insertion loss IN-TV	3 dB ± 0,5 dB	10 dB ± 1,5 dB	14 dB ± 1,5 dB	18 dB ± 1,5 dB
Insertion loss IN-FM	6 dB ± 0,5 dB	12 dB ± 1,5 dB	16 dB ± 1,5 dB	20 dB ± 1,5 dB
Through loss	-	3 dB ± 0,5 dB	2 dB ± 0,5 dB	1,5 dB ± 0,5 dB
Isolation TV-FM	typ. 25 dB			
Ambient temperature	-20…+50 °C			

TV Socket Outlets (SMATV)

ASE 5 F
UNiSocket 310
UNiSocket 314
UNiSocket 318
AST 52 F

- To be used in SMATV networks.
- For selective separation of the broadband frequency range 5 … 2250 MHz.
- The products are equipped with screw and claws fastening, suitable for flush-mounted installation boxes with a diameter of 55 mm.
- The antenna sockets can be combined with almost all installation programs.
- Delivery is without cover plate.

Model Art. No.	ASE 5 F 850006	UNiSocket 310 852106	UNiSocket 314 852107	UNiSocket 318 852108	AST 52 F 850004
EAN	4040326500064	4040326521069	4040326521076	4040326521083	4040326500040
Type	Stubline Socket	Through Socket	Through Socket	Through Socket	TWIN Socket
Frequency range SAT	950 … 2400 MHz	950 … 2250 MHz			950 … 2200 MHz
Frequency range TV	5 … 862 MHz	5 … 68 MHz 118 … 862 MHz			5 … 862 MHz
Frequency range FM	87,5 … 230 MHz	87,5 … 108 MHz			87,5 … 230 MHz
Tap loss IN - SAT	2 dB ± 0,5 dB	10 dB ± 2 dB	14 dB ± 2 dB	18 dB ± 2 dB	2,5 dB ± 0,5 dB
Tap loss IN - TV	3 dB ± 0,5 dB	10 dB ± 2 dB	14 dB ± 2 dB	18 dB ± 2 dB	3 dB ± 0,5 dB
Tap loss IN - FM	6,5 dB ± 0,5 dB	10 dB ± 2 dB	14 dB ± 2 dB	18 dB ± 2 dB	6 dB ± 0,5 dB
Through loss typ.	-	3,5 dB ± 0,5 dB	2,5 dB ± 0,5 dB	2 dB ± 0,5 dB	-
Isolation TV - SAT	typ. 25 dB				typ. 20 dB
Isolation FM - SAT	typ. 22 dB				typ. 25 dB
Isolation TV - FM	typ. 20 dB				typ. 12 dB
SAT power pass	max. 20 V / 1 A				max. 20 V / 1 A
Ambient temperature	-20 … +50 °C				

Earth Bonding Bars

EW Fix

EW 5 F - Quick connector

EW 5 F - Jack

EW 4, EW 5, EW 6

- Space between connectors 20 mm.
- Including mounting screws.
- For equipotential bonding with 4 mm² cable.
- With each earth bonding bar one EW Fix is included in the scope of delivery.

Model Art. No.	EW 4 852113	EW 5 852114	EW 6 852115
EAN	4040326521137	4040326521144	4040326521151
Connectors	4	5	6
Dimensions (mm)	77 x 45 x 35	97 x 45 x 35	117 x 45 x 35

Ground Block

EB 2, EB 4

- For equipotential bonding with 4 mm² cable.

Model Art. No.	EB 2 852120	EB 4 852119
EAN	4040326521205	4040326521199
Dimensions (mm)	85 x 26 x 27	147 x 26 x 27

Ground Clamp

EDKL 2/Set

- Suitable for many SPAUN F connectors with D-type.
- For equipotential bonding with 4 mm² cable.

Set = 5 pcs. (sales unit).

Model Art. No.	EDKL 2/Set 872023
EAN	4040326720233
Dimensions (mm)	33 x 14 x 1

Ground Clamp

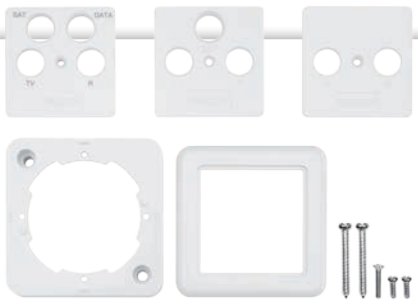
EDKL 1/Set

- Suitable for many F connectors.
- For equipotential bonding with 4 mm² cable.

Set = 5 pcs. (sales unit).

Model Art. No.	EDKL 1/Set 872013
EAN	4040326720134
Dimensions (mm)	35 x 14,5 x 1

Surface Mount Cover Plate



AMR U/Set

- For TV socket outlets according to DIN 45330.
- Can be used with all SMATV and CATV sockets from SPAUN
- Includes cover plates (2, 3 and 4 hole).

Model Art. No.	AMR U/Set 850005
EAN	4040326500057
Dimensions (mm)	78 x 78 x 40

Terminating Resistors

❶ ❷

ASR 75/Set, DCR 75/Set

❶ Terminating resistors 75 Ω

❷ Terminating resistors 75 Ω for UNiSocket 310/314/318, MediaSocket 410/414/419, DC decoupled

Model Art. No.	ASR 75/Set 871512	DCR 75/Set 871513
EAN	4040326715123	4040326715130
Ambient temperature	-20 … +50 °C	
Dimensions (mm)	18,5, 3,5 Ø	18,5, 3,5 Ø

Elbow Connector

WS 90 F/Set

Set of 4 pcs.

Model Art. No.	WS 90 F/Set 871502
EAN	4040326715024
Screening attenuation	> 90 dB
DC pass	max. 20 V / 1 A
Dimensions (mm)	25 x 22 x 10

DC - Blocker

DCF 500/Set

Set of 2 pcs.

Model Art. No.	DCF 500/Set 871506
EAN	4040326715062
Impedance	75 Ω
Through loss trunk terrestrial SAT	 < 0,5 dB < 0,5 dB
Voltage	max. 20 V
Dimensions (mm)	33, 12 ∅

Terminating Resistor

❶ 

❷ 

ZFR 75 DC/Set, ZMR 75 DC/Set

DC decoupled termination resistors.

Set of 2 pcs.

❶ **ZFR 75 DC**

❷ **ZMR 75 DC**

Model Art. No.	ZFR 75 DC/Set 871511	ZMR 75 DC/Set 871514
EAN	4040326715116	4040326715147
Impedance	75 Ω	75 Ω
Voltage	max. 20 V	max. 20 V
Dimensions (mm)	27, 12 ∅	27, 12 ∅

Terminating Resistor

ZSR 75 F/Set

Non DC decoupled termination resistor.

Set of 5 pcs.

Model Art. No.	ZSR 75 F/Set 871501
EAN	4040326715017
Impedance	75 Ω
Voltage	max. 0 V
Dimensions (mm)	12,5 ∅

Push On F Coupler (male)

ZSV 10/Set

Set of 10 pcs.

Model Art. No.	ZSV 10/Set 871538
EAN	4040326715383
Trough loss trunk Terrestrial SAT	 0,2 dB 0,4 dB
DC pass	max. 20 V / 1 A
Dimensions (mm)	29, 12 ∅

F Coupler (female)

SFV 2/Set

Set of 2 pcs.

Model Art. No.	SFV 2/Set 872616
EAN	4040326726167
Trough loss trunk Terrestrial SAT	 0,2 dB 0,4 dB
DC pass	max. 20 V / 1 A
Dimensions (mm)	26, 12 ∅

F Connectors 5.3 (compression)

FKS 53/Set

Set of 50 pcs.

Model Art. No.	FKS 53/Set 872600
EAN	4040326726006
Screening attenuation (30-862 MHz)	> 90 dB*
Packing unit	50

* depending on the used coaxial cable

Optical Headend DVB-S/S2 to Fibre

(page 12)

L_BOX SOTx

- Up to 16 SAT IF signals and terrestrial on a single fibre optics cable.
- 19" Base unit with redundant switched-mode power supply.
- Distribution to up to 32 optical nodes is possible.
- Configuration and monitoring via LAN/IP.

Application samples

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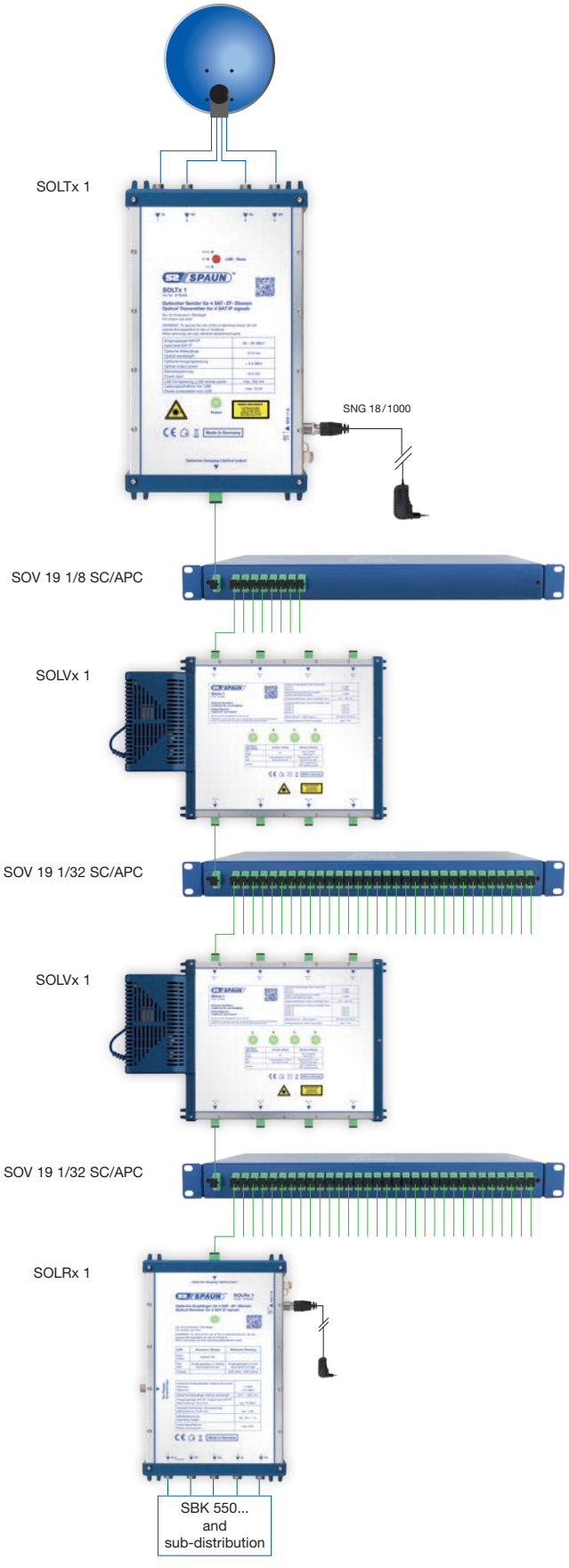
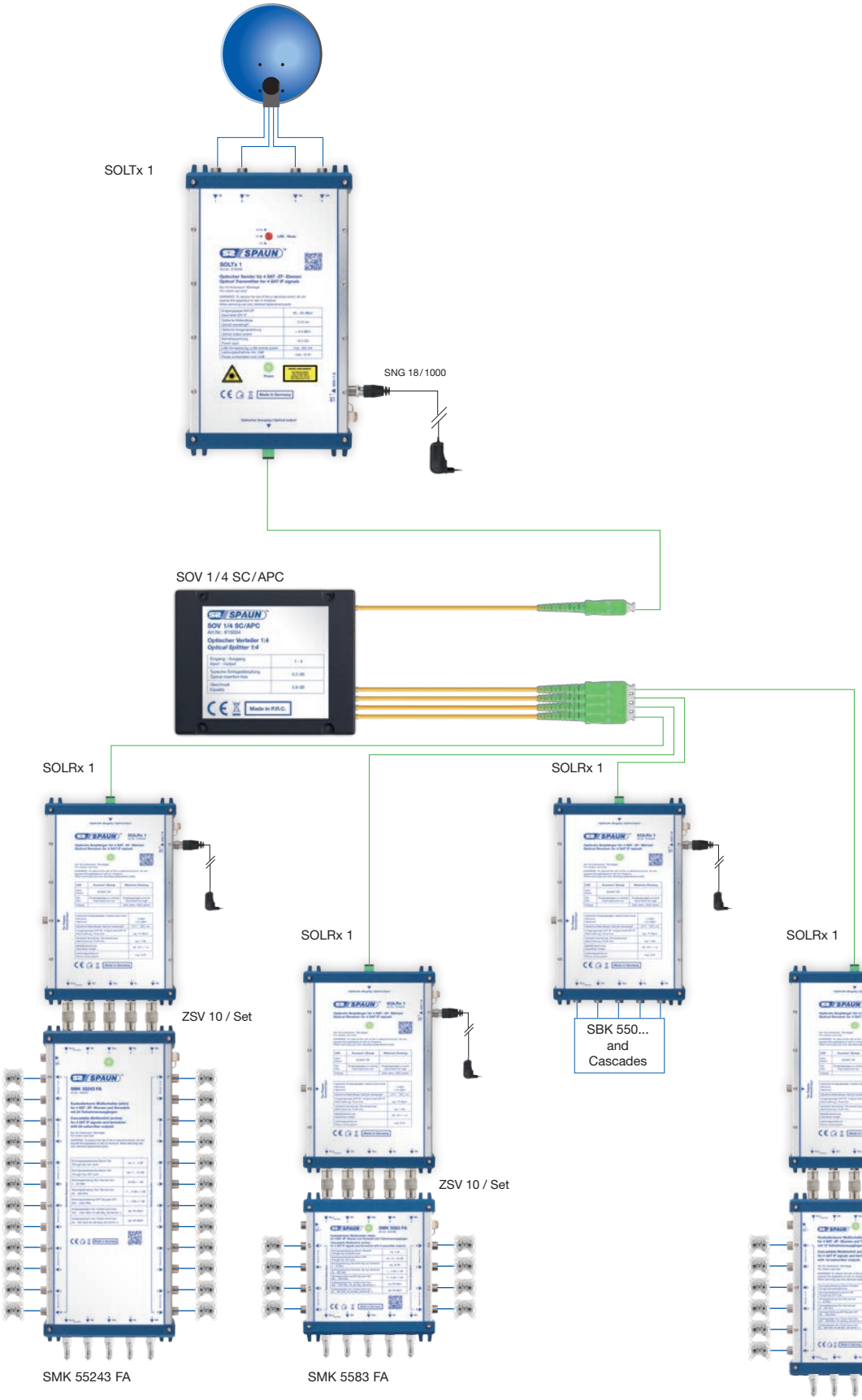


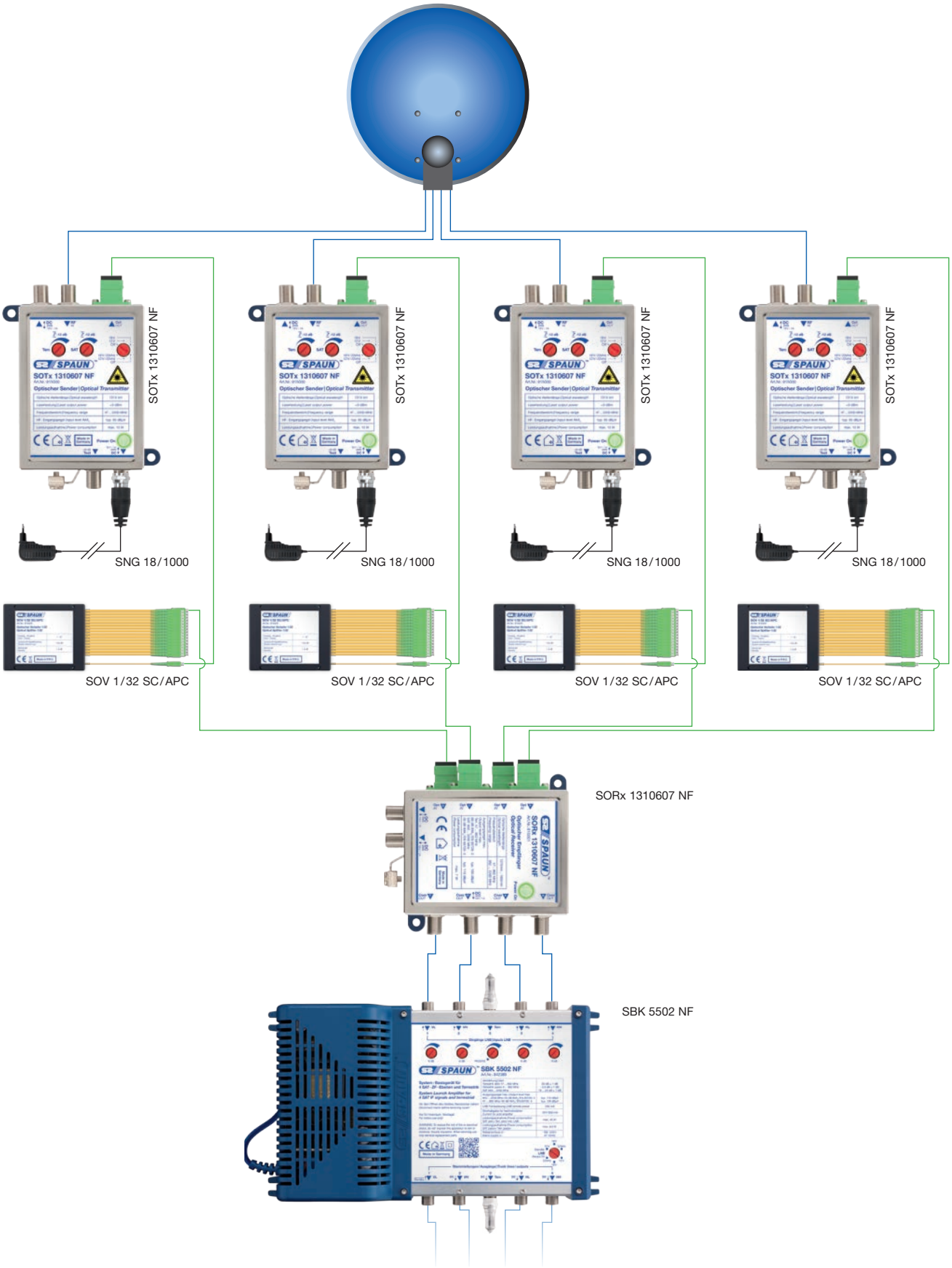
Optical distribution of 4 SAT IF signals to up to 8192 optical nodes with subsequent sub-distribution.

SPAUN recommends according EN 60728-11

EW 4 Art. No.: 852113
EW 5 Art. No.: 852114
EW 6 Art. No.: 852115



Optical distribution of 4 SAT IF signals on 4 optical nodes with subsequent sub-distribution.



sub-distribution

Optical distribution of 4 SAT IF signals on 32 optical nodes with subsequent sub-distribution.

Q_Box 16: Headend
for 16 QAM channels

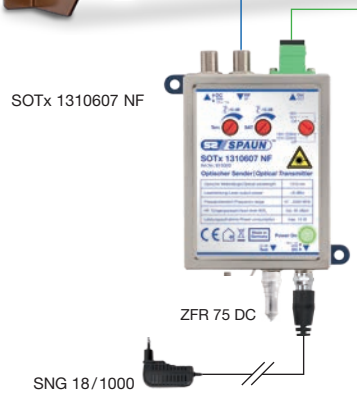
AURORA SOTx

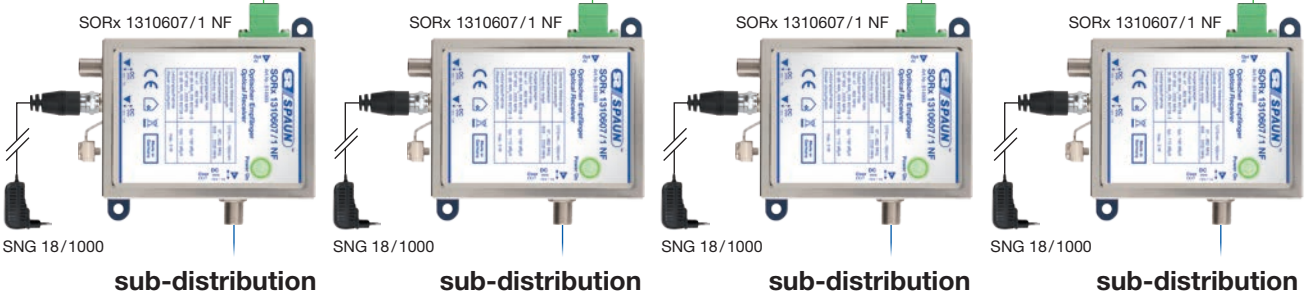
AURORA SORx

sub-distribution

Conversion of up to 16 QAM channels and optical transmission for long distances.

Q_Box 16: Headend
from DVB-S/S2 into 16 DVB-C (QAM) channels





sub-distribution **sub-distribution** **sub-distribution** **sub-distribution**

Conversion from DVB-S/S2 into DVB-C (QAM);
16 QAM channels with optical distribution on 4 nodes-star distribution.

Q_Box 16: Headend
from DVB-S/S2 into 16 DVB-C (QAM) channels

SOTx 1310607 NF

ZFR 75 DC

SNG 18/1000

200 m

SOC 10/90 SC/APC

50 m

SORx 1310607/1 NF

SNG 18/1000

sub-distribution

1 km

SOC 20/80 SC/APC

50 m

SORx 1310607/1 NF

SNG 18/1000

sub-distribution

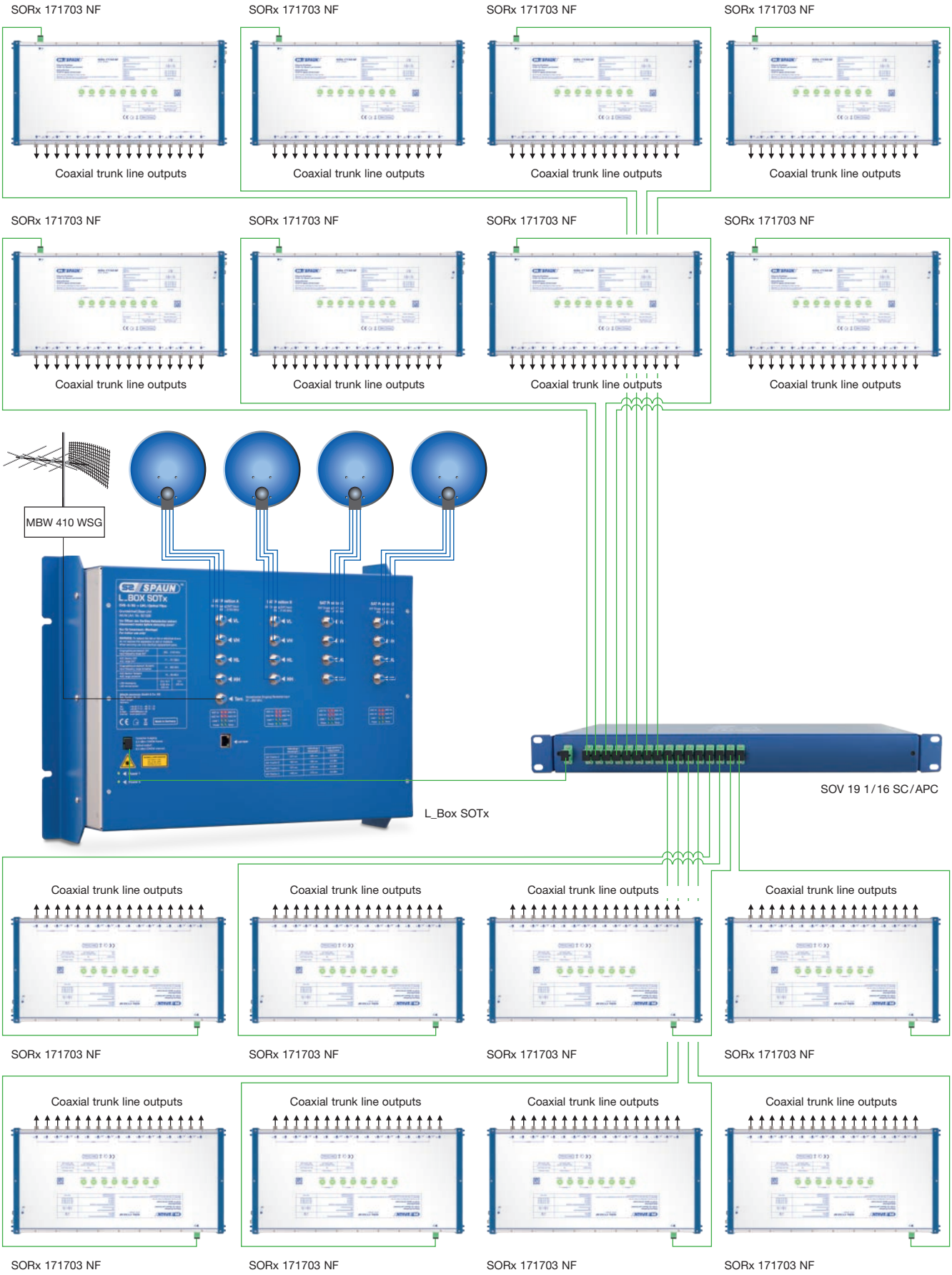
800 m

SNG 18/1000

SORx 1310607/1 NF

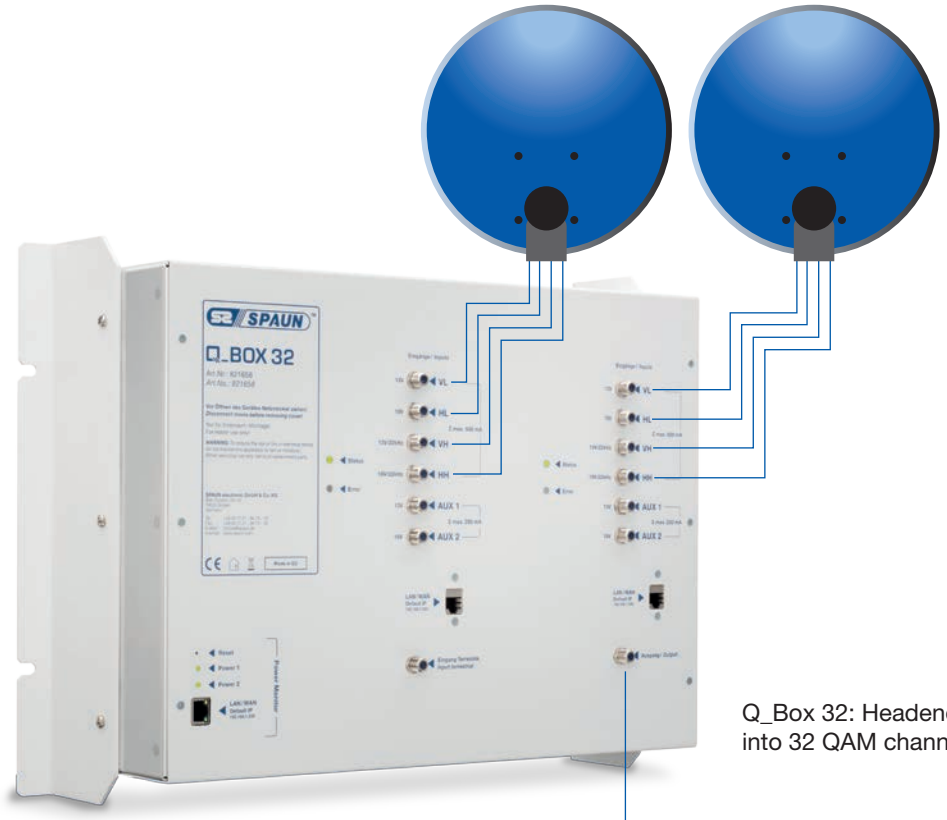
sub-distribution

**Conversion from DVB-S/S2 into DVB-C (QAM);
16 QAM channels with optical distribution on 3 nodes - tree distribution.**



Junction of 16 SAT IF signals and DVB-T on a single mode fibre and a distribution on 16 optical nodes.

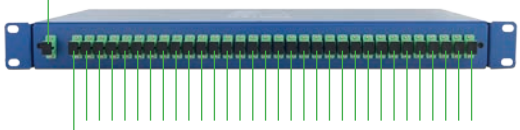
Application samples



Q_Box 32: Headend DVB-S/S2
into 32 QAM channels

SOLAS SOTx

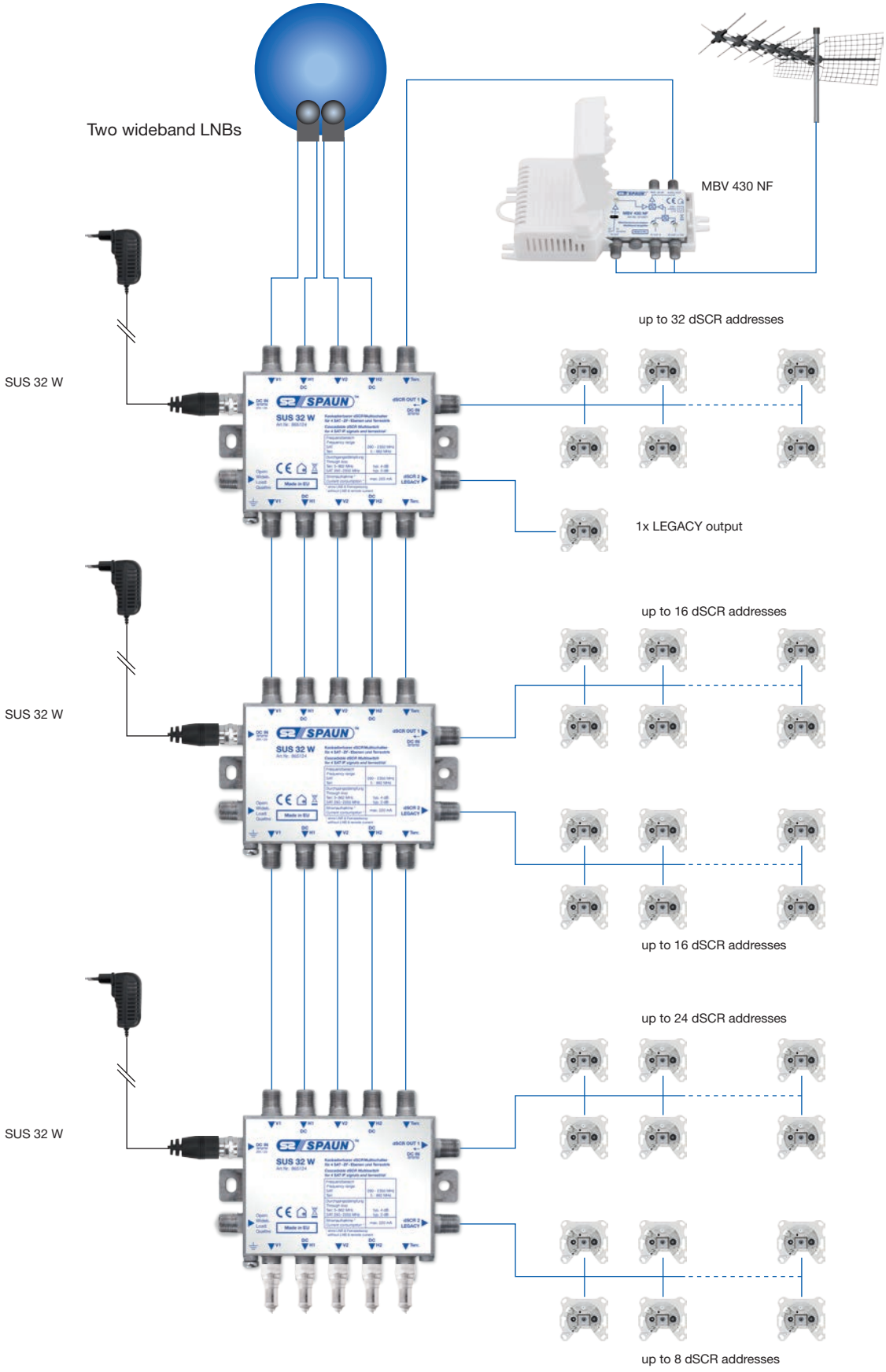
SOV 19 1/32 SC/APC



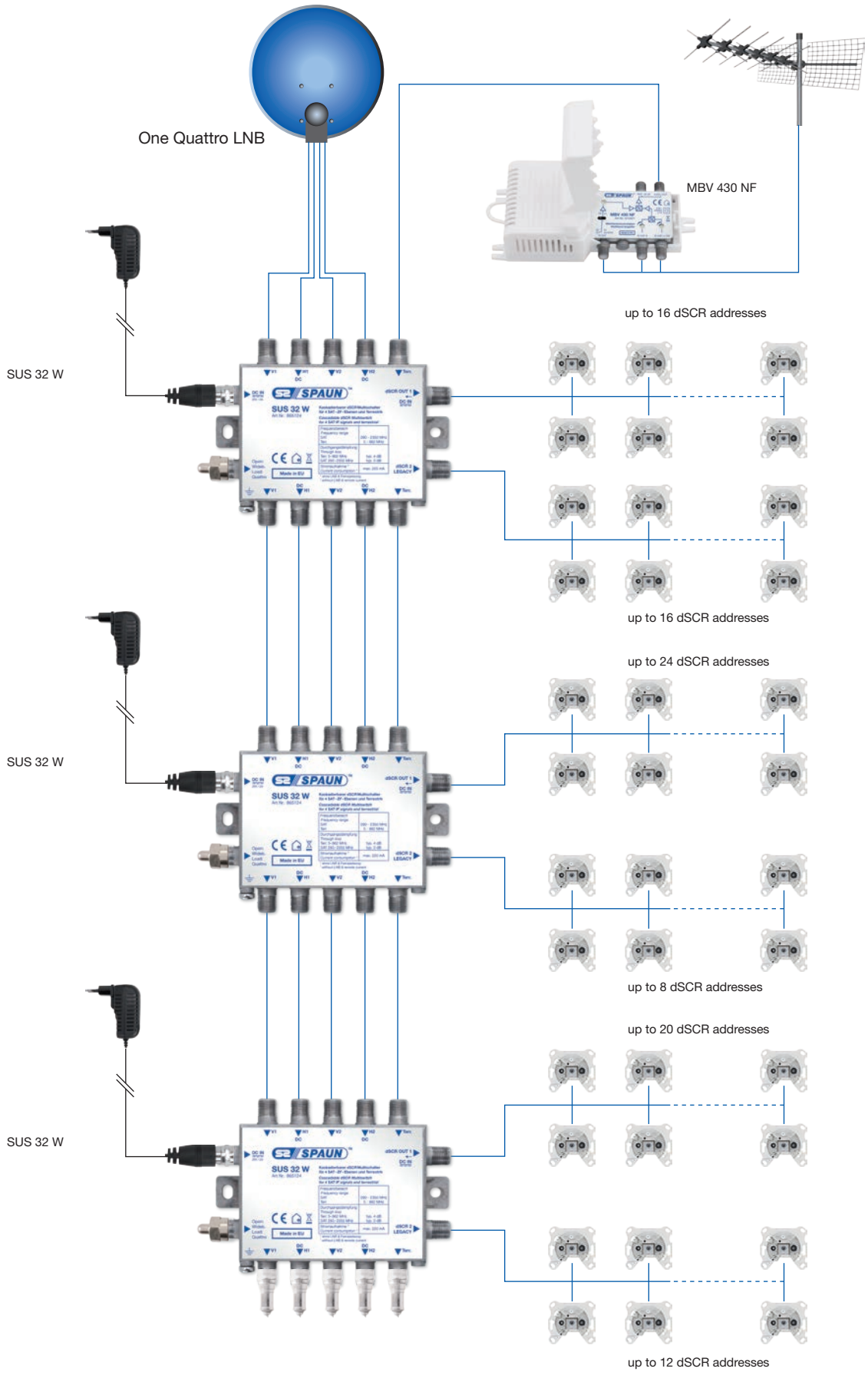
SOLAS SORx

sub-distribution

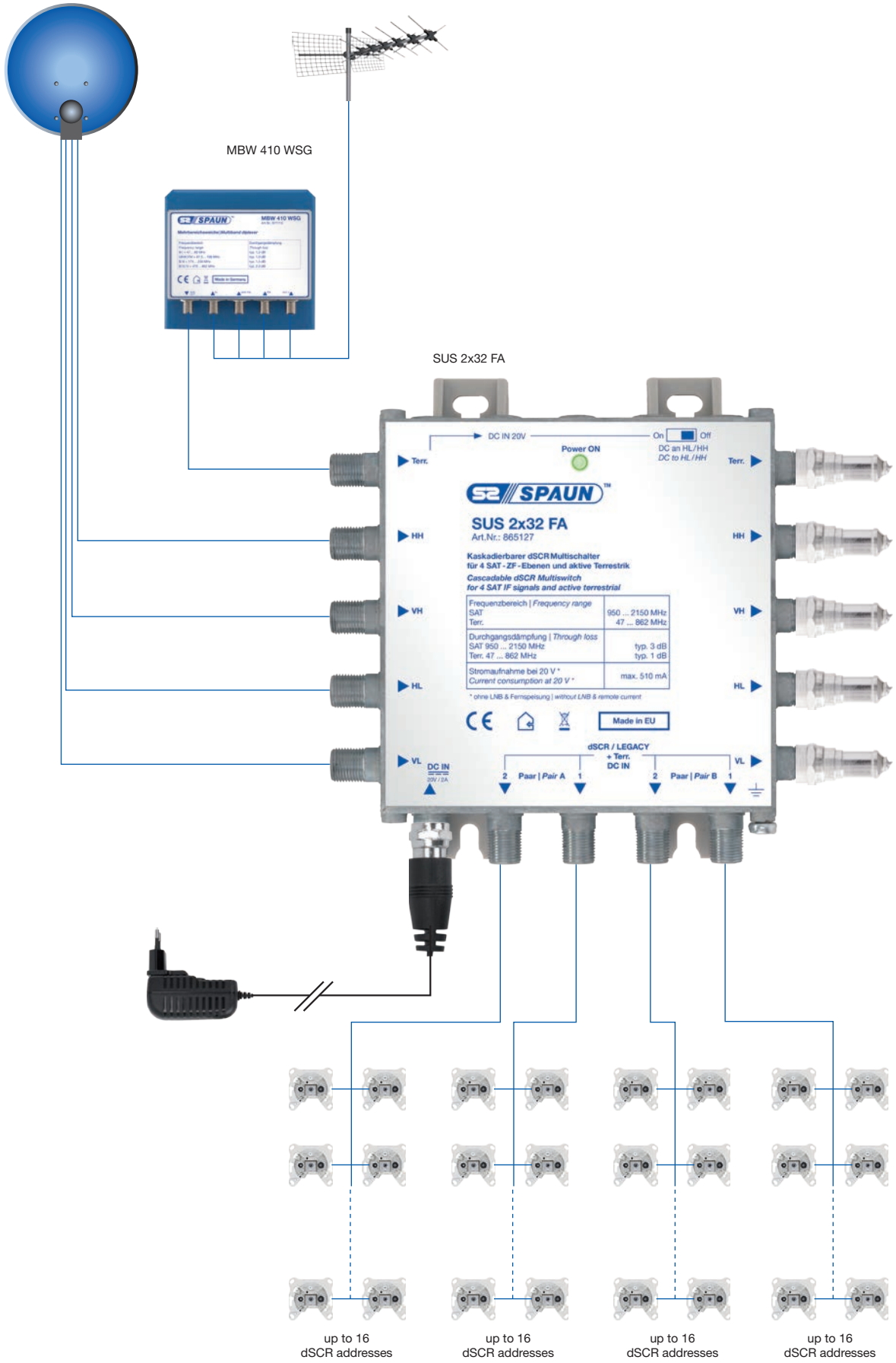
**Conversion from DVB-S/S2 into DVB-C (QAM);
32 QAM channels with optical distribution on up to 32 nodes.**



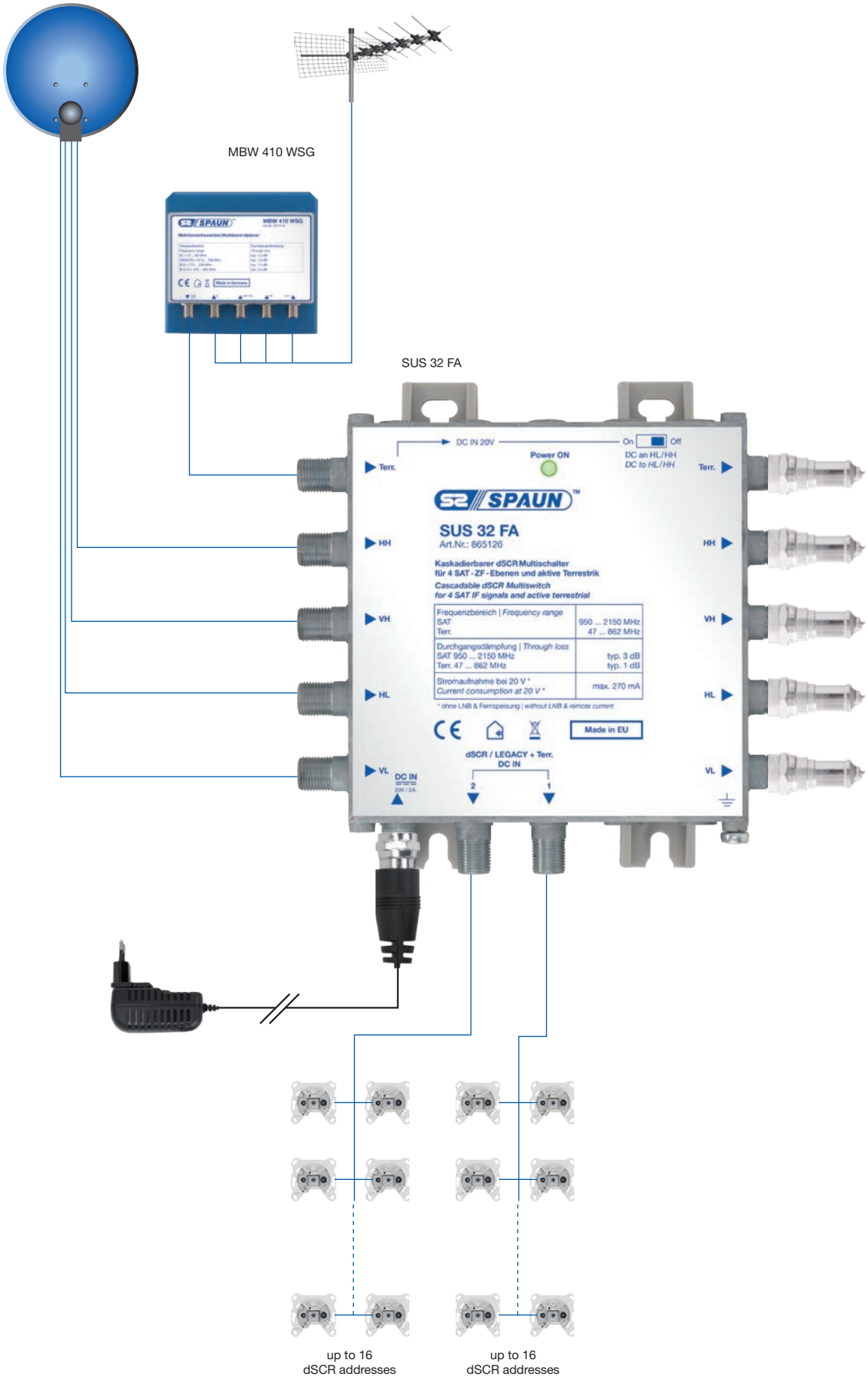
dSCR system for 2 SAT positions and terrestrial with different output configurations (Single cable and LEGACY) for 97 subscriber.



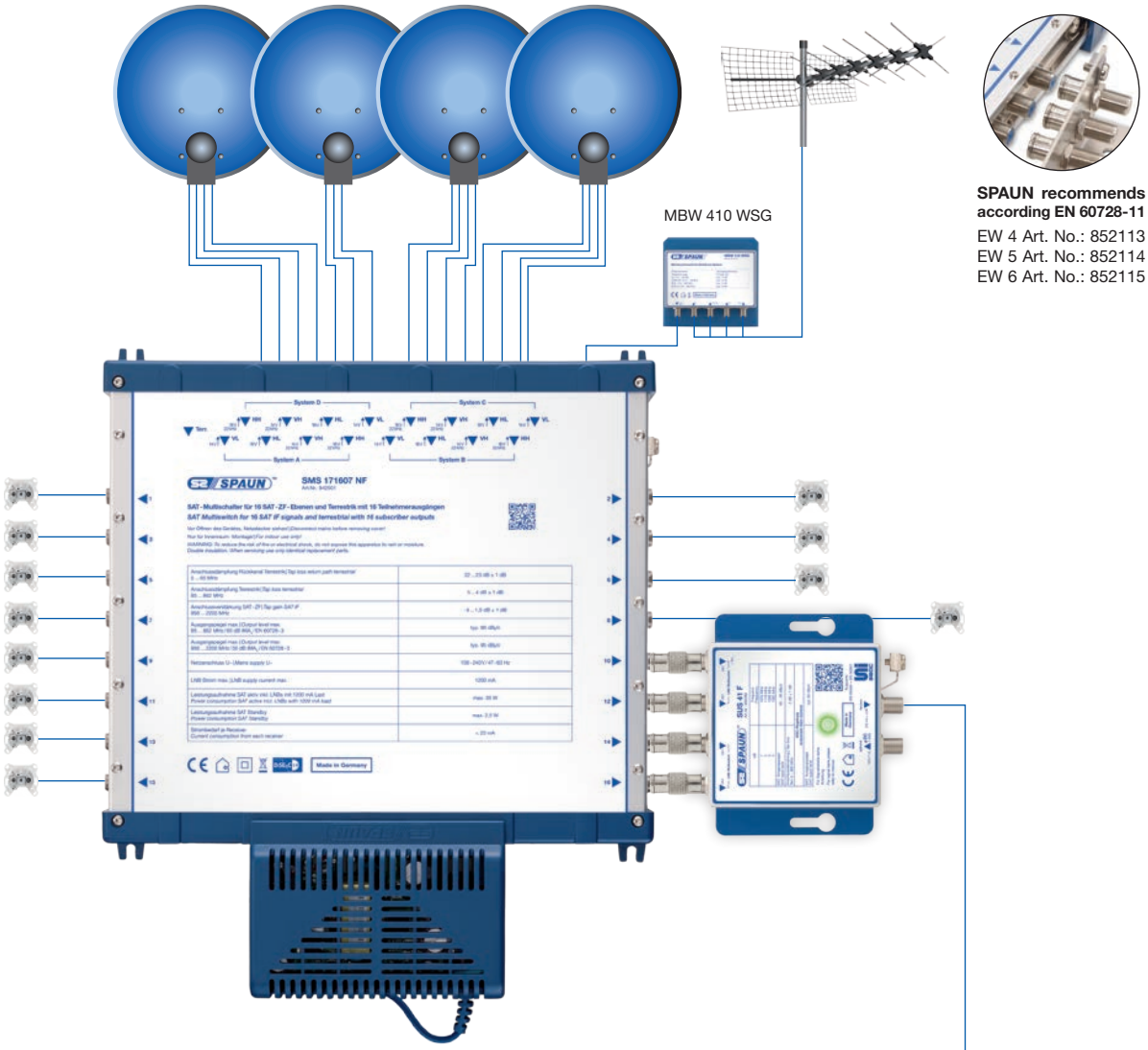
dSCR system for 1 SAT position and terrestrial with Single cable outputs for 96 subscriber.



dSCR distribution for 4 SAT IF signals and active terrestrial for 4 outputs and each output to up to 16 dSCR addresses.



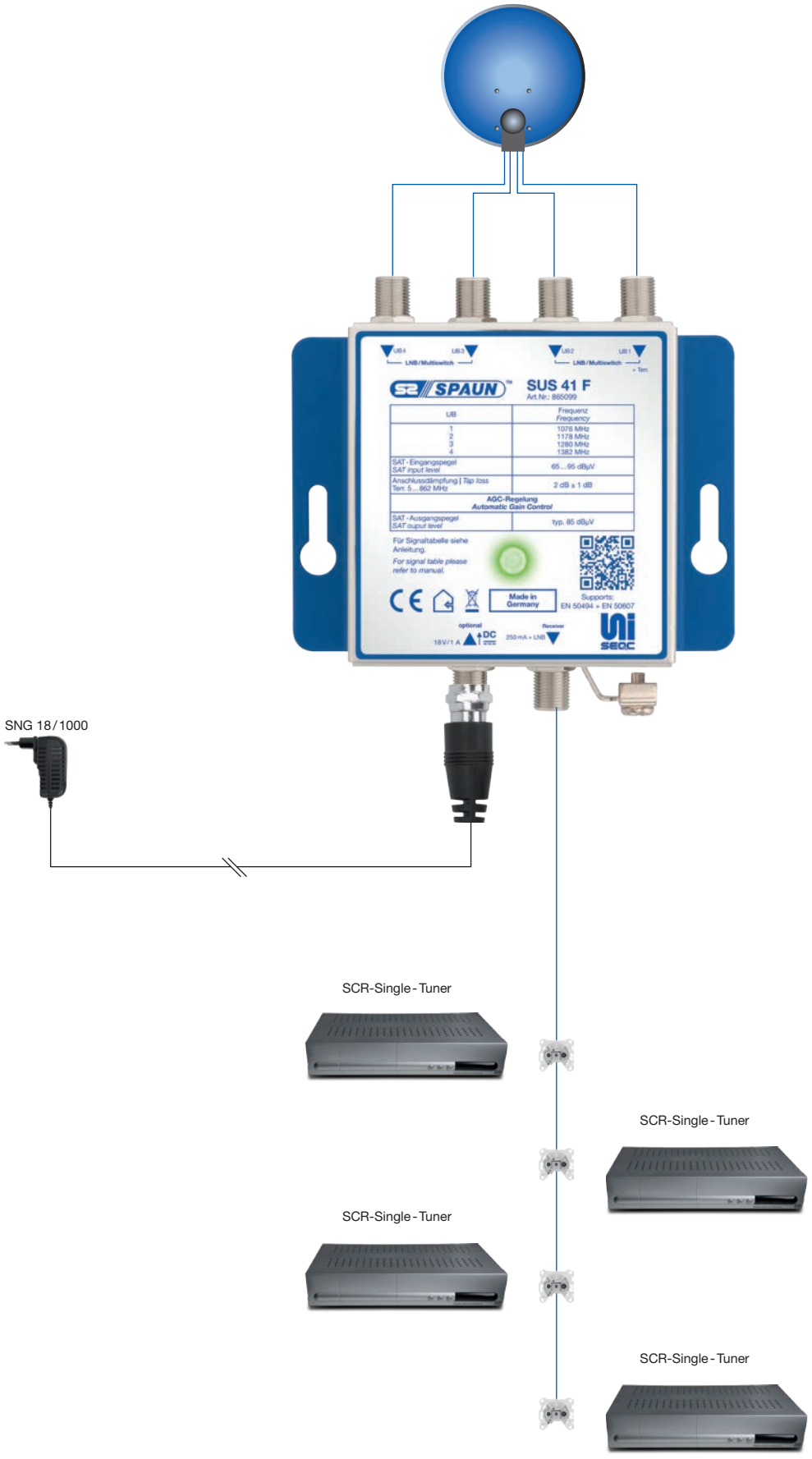
dSCR distribution for 4 SAT IF signals and active terrestrial for 2 outputs and each output to up to 16 dSCR addresses.



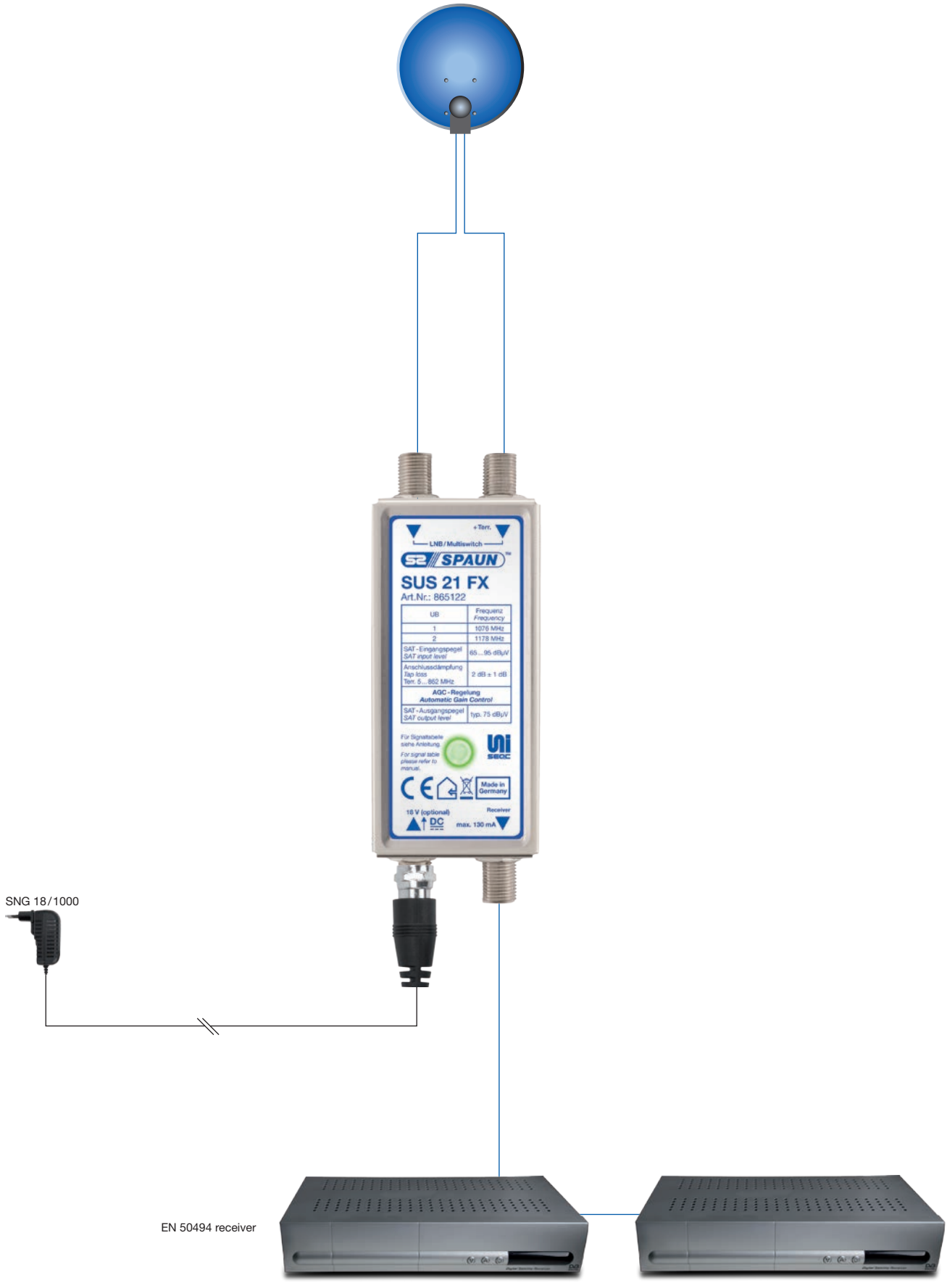
SPAUN recommends according EN 60728-11

EW 4 Art. No.: 852113
EW 5 Art. No.: 852114
EW 6 Art. No.: 852115

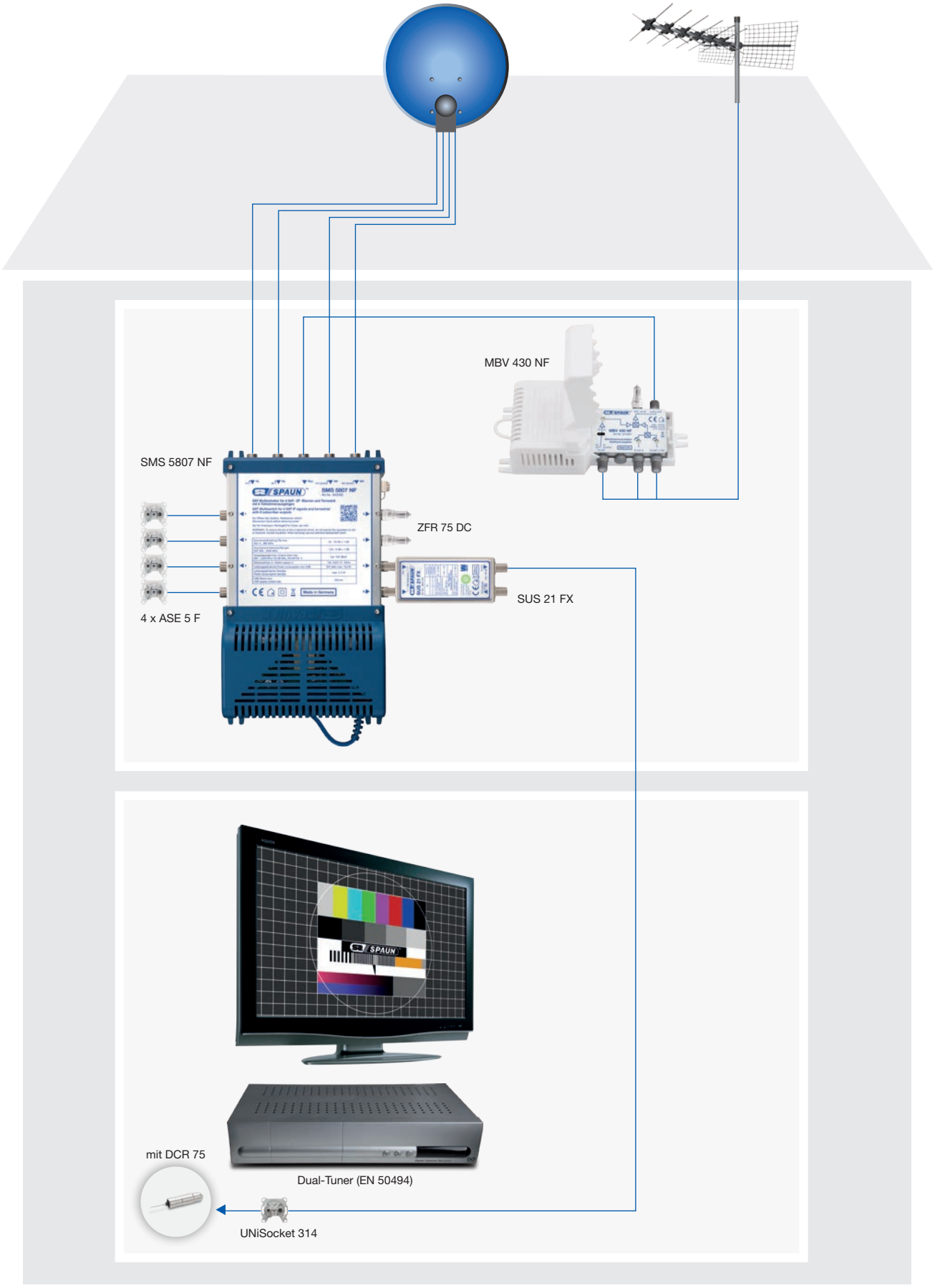
Single Cable system with 4 subscriber outputs connected to a multiswitch with 16 SAT IF signals.



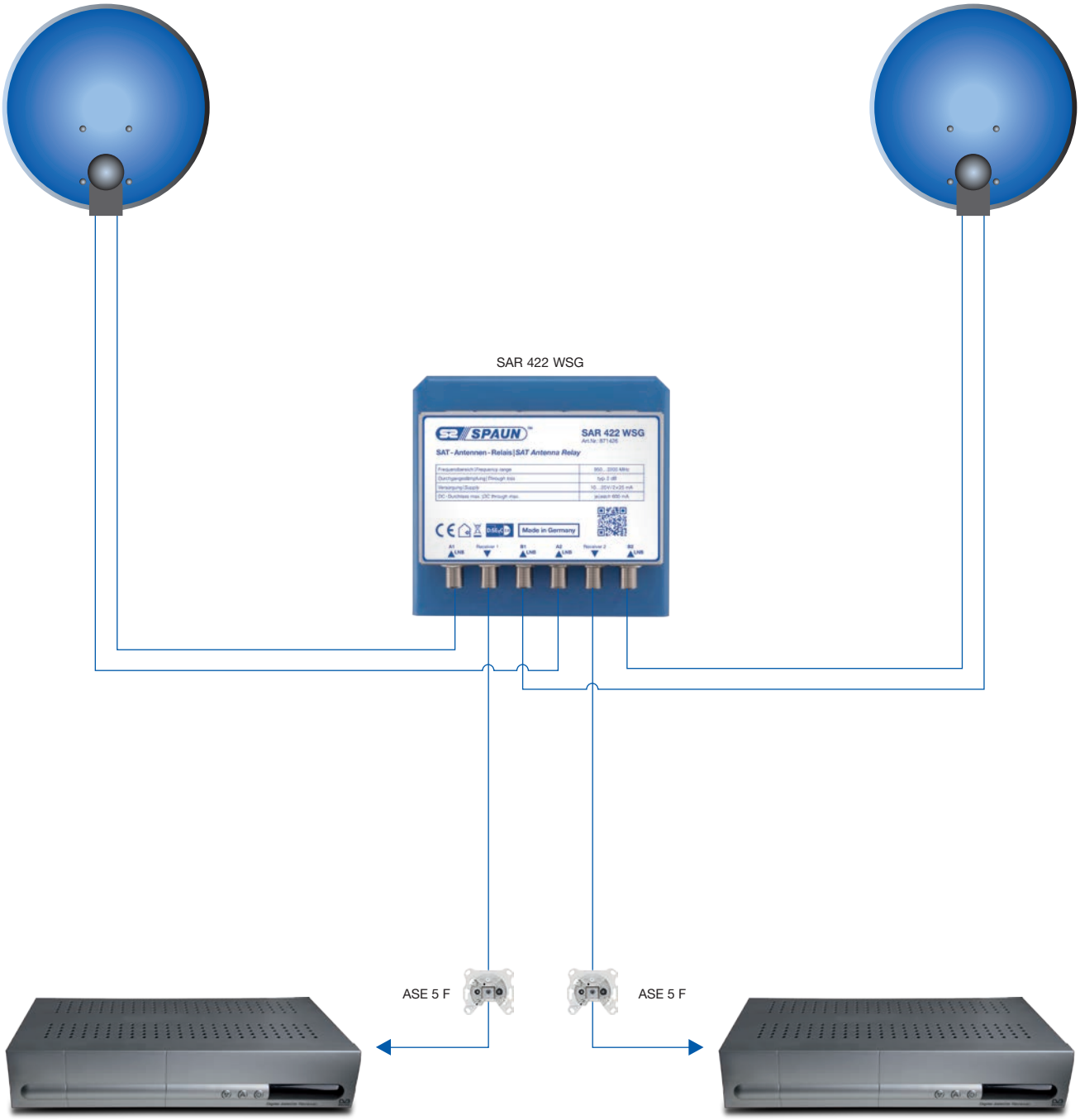
QUAD-LNB on one down lead for 4 SCR receivers (EN 50494 or EN 50607).



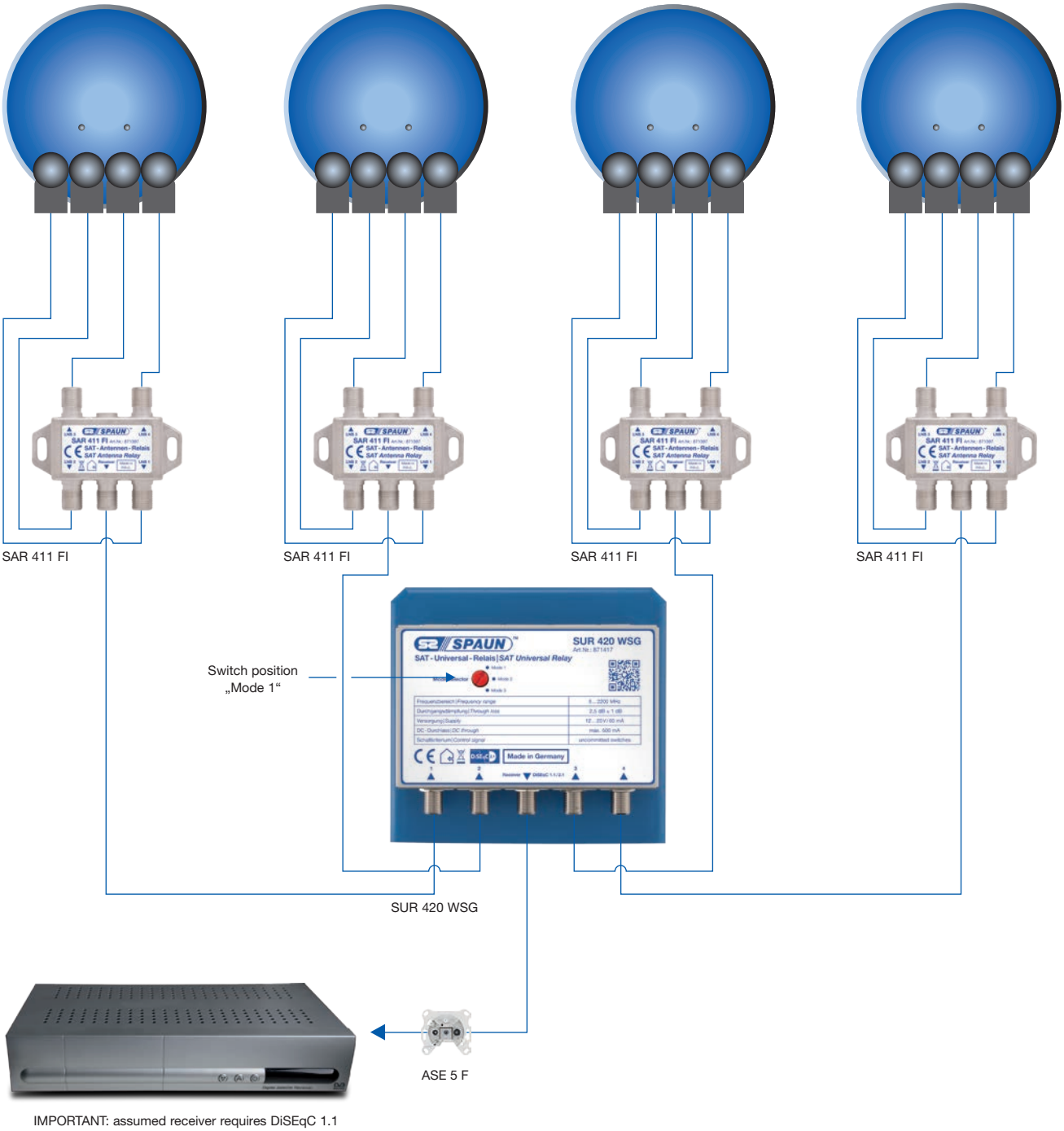
TWIN LNB on one down lead cable for two SCR receivers.



Upgrade of a 5 input system with two single cable outputs.

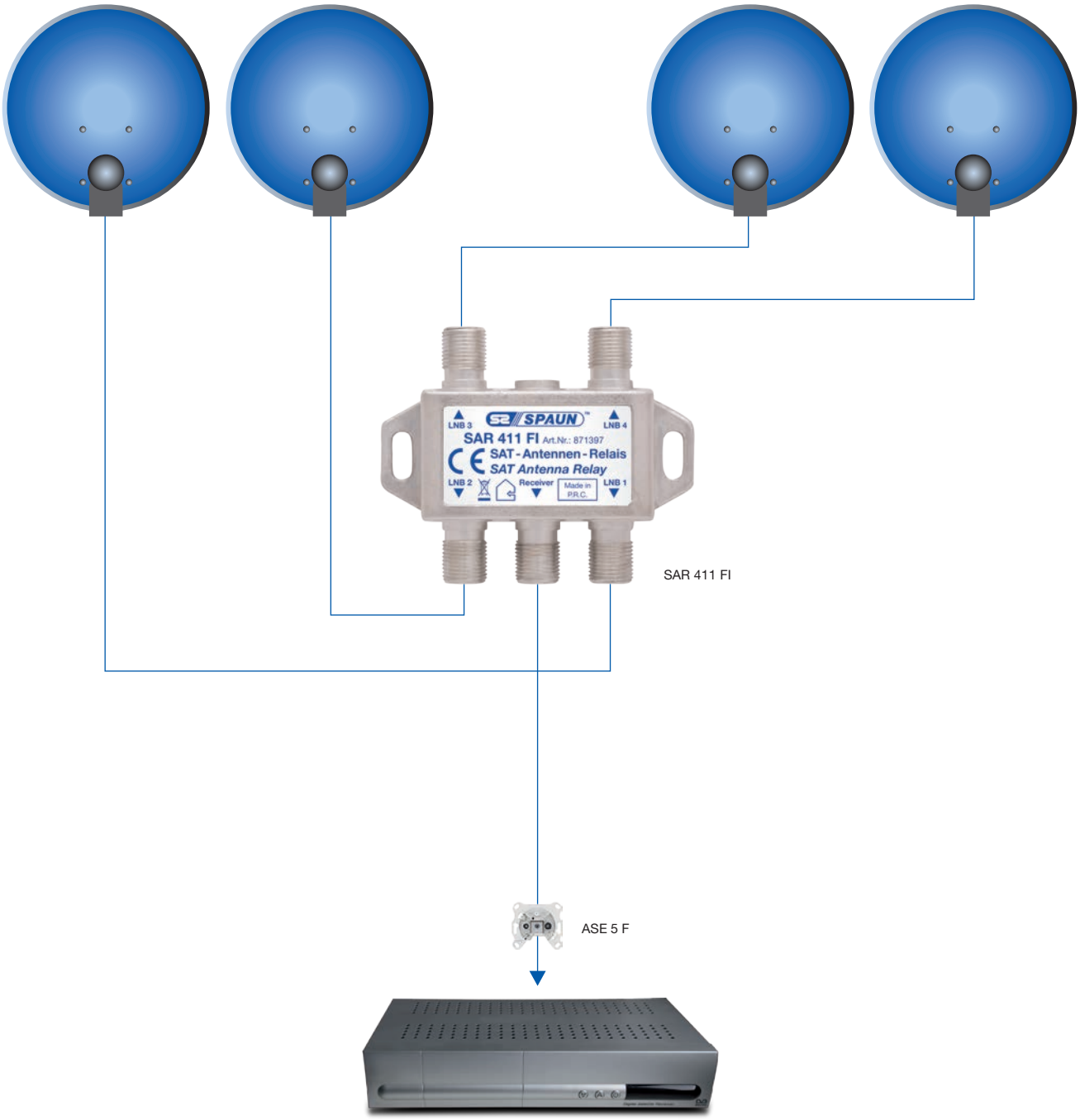


Hookup of 2 TWIN LNBs.

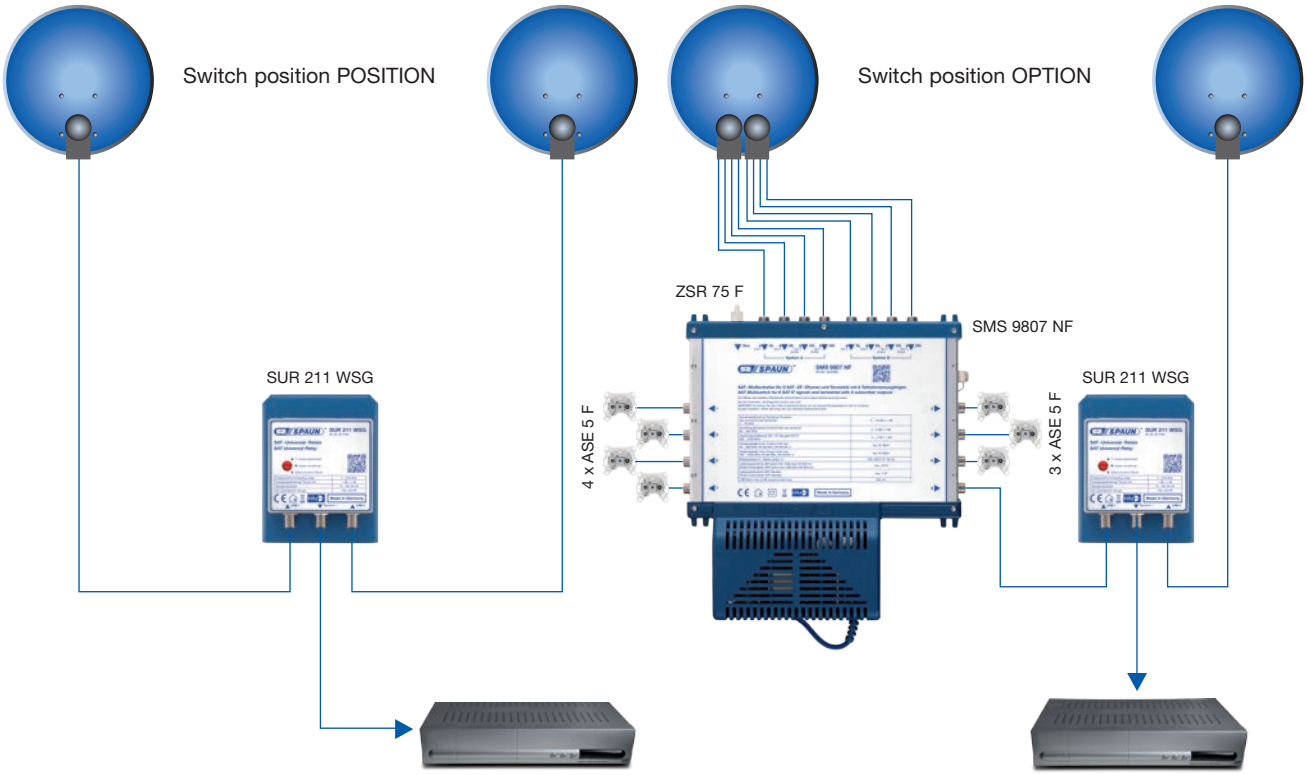


IMPORTANT: assumed receiver requires DiSEqC 1.1

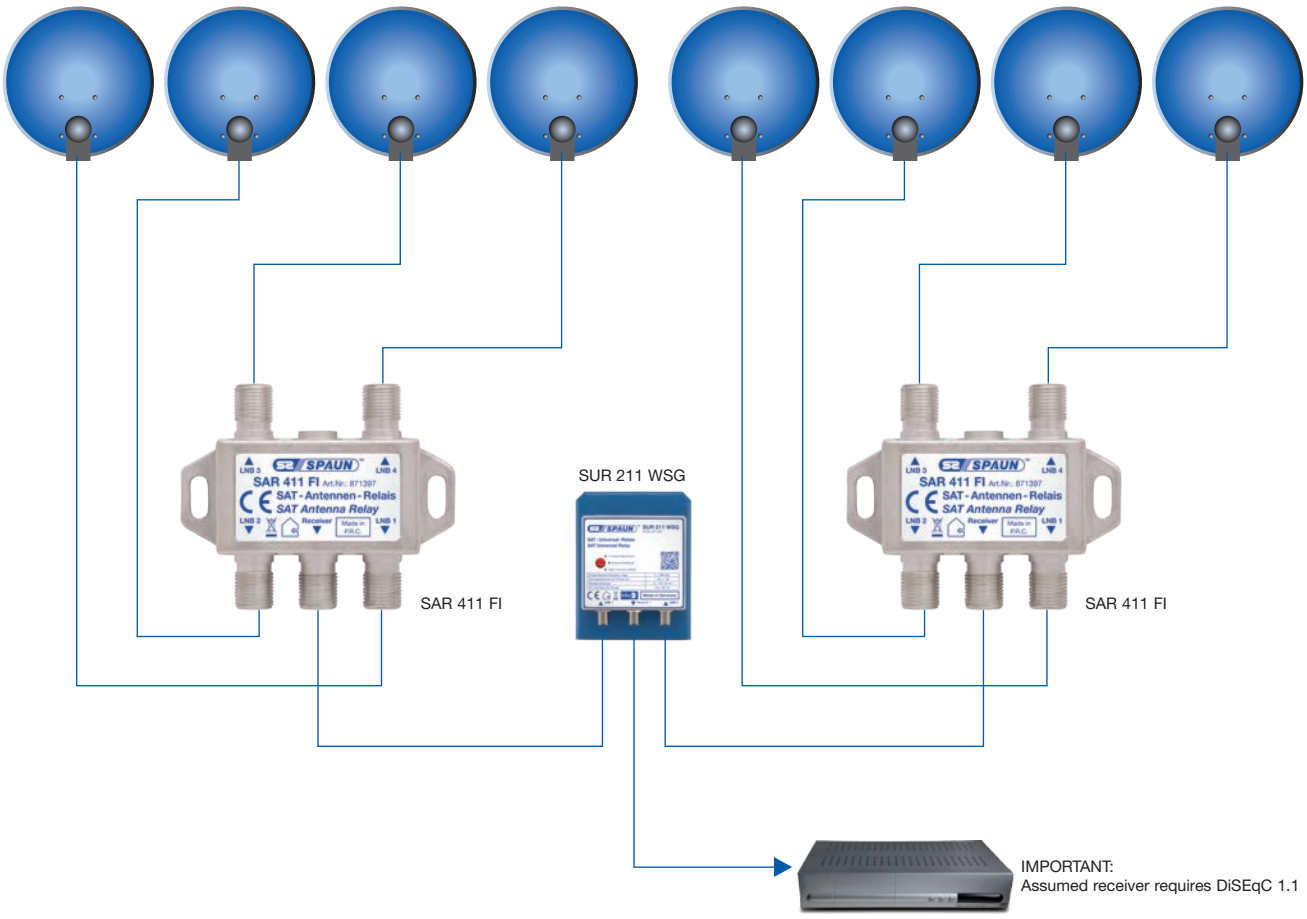
16 SAT positions (64 SAT IF signals) for one subscriber output.



Hookup of 4 single LNBs for 1 receiver.



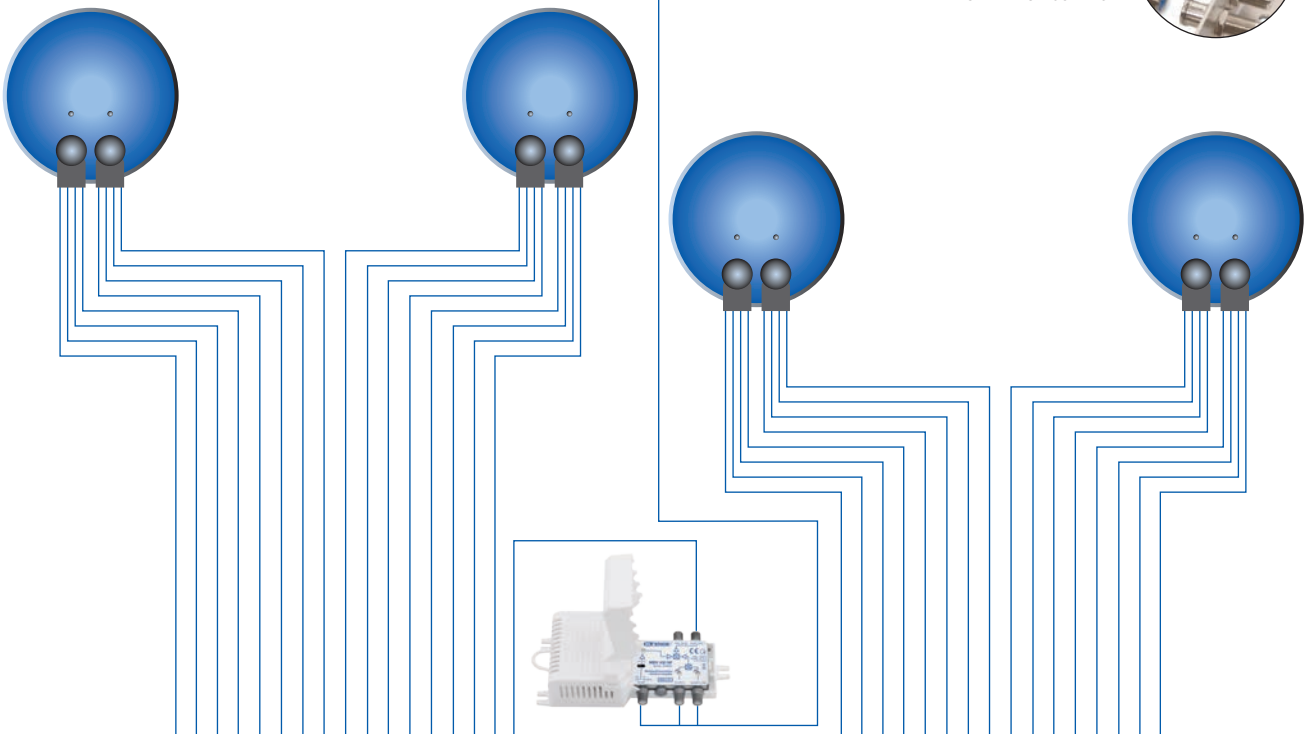
Switch position 1st Uncommitted Switch



Application possibilities of SUR 211 WSG.

SPAUN recommends according EN 60728-11

EW 4 Art. No.: 852113
EW 5 Art. No.: 852114
EW 6 Art. No.: 852115



MBV 430 NF

VBE 2 PD

SMS 17089 NF

4 x ASE 5 F

2 x ASE 5 F

ZFR 75 DC

SMS 17089 NF

4 x ASE 5 F

2 x ASE 5 F

ZFR 75 DC

SUR 211 WSG

One relay per subscriber is necessary.

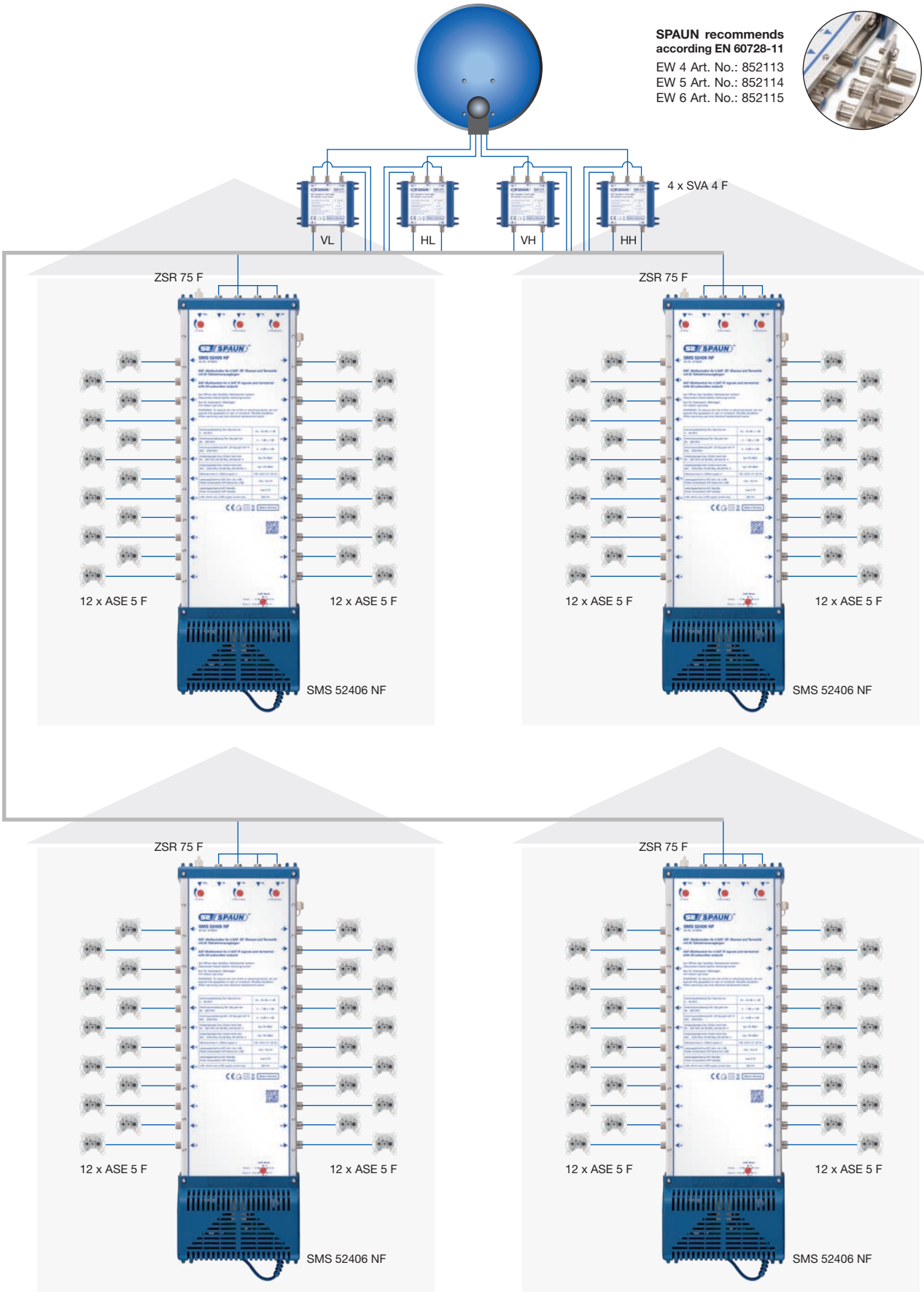
ASE 5 F

DiSEqC - Receiver 1.1

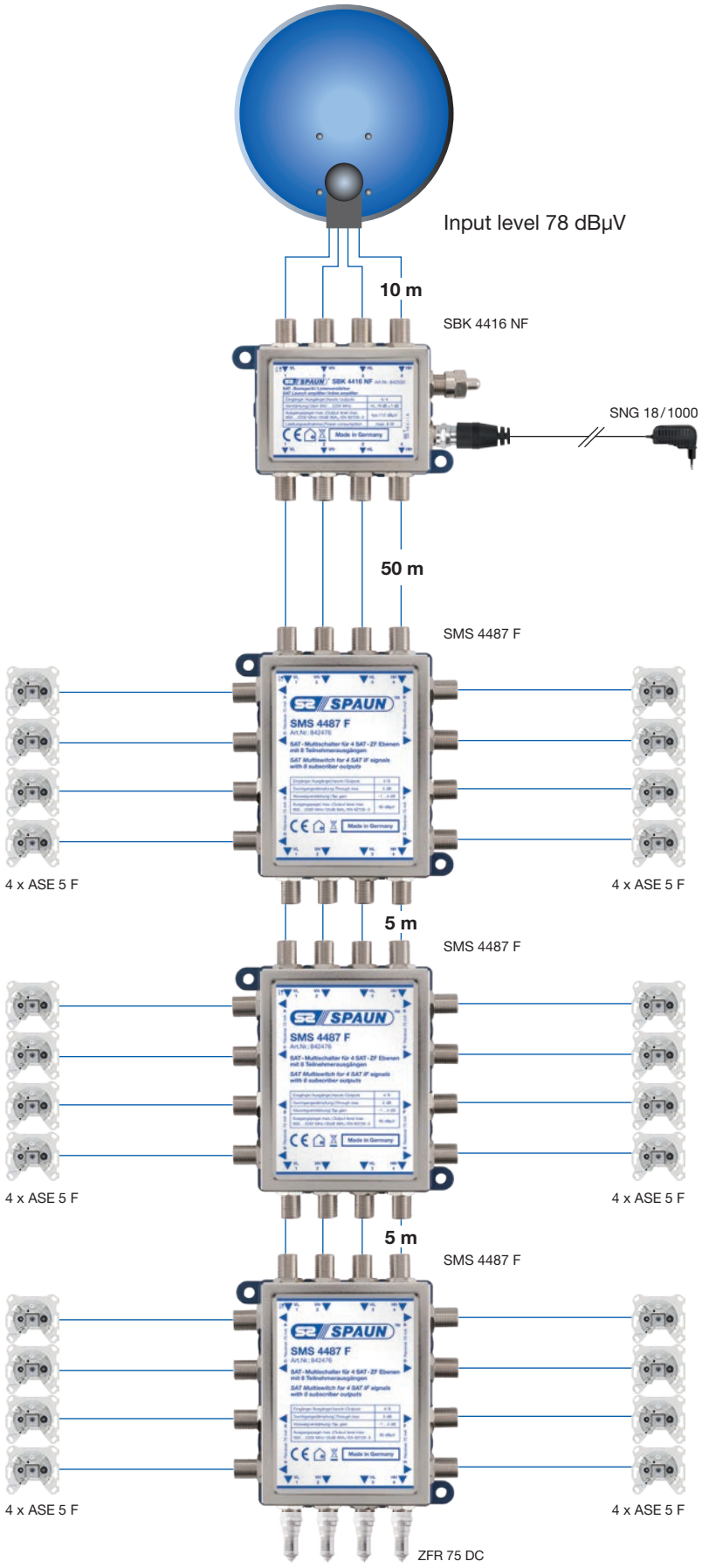
SUR 211 WSG must use switch position 1st Uncommitted Switch.

8 SAT positions (32 SAT IF signals) and terrestrial for 8 subscribers.

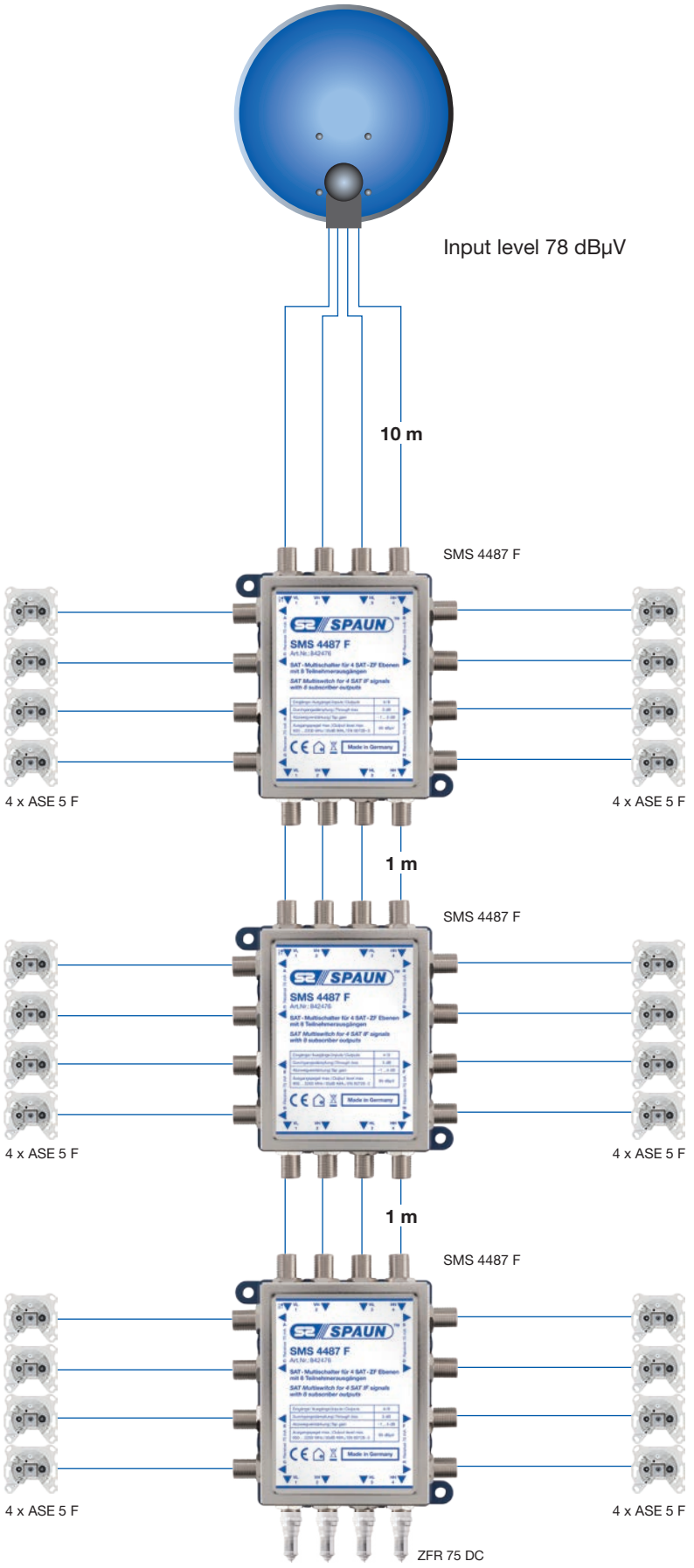
Application samples



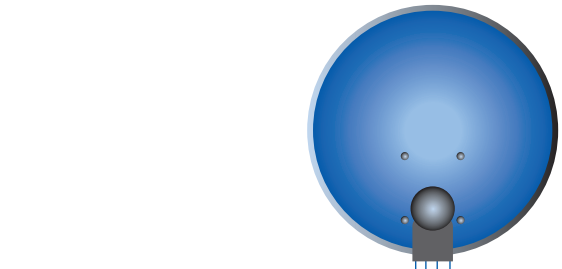
1 SAT position (4 SAT IF signals) for 4 houses with each 24 subscribers.



1 SAT position (4 SAT IF signals) for 24 subscribers.



1 SAT position (4 SAT IF signals) for 24 subscribers.



Input level 78 dBµV

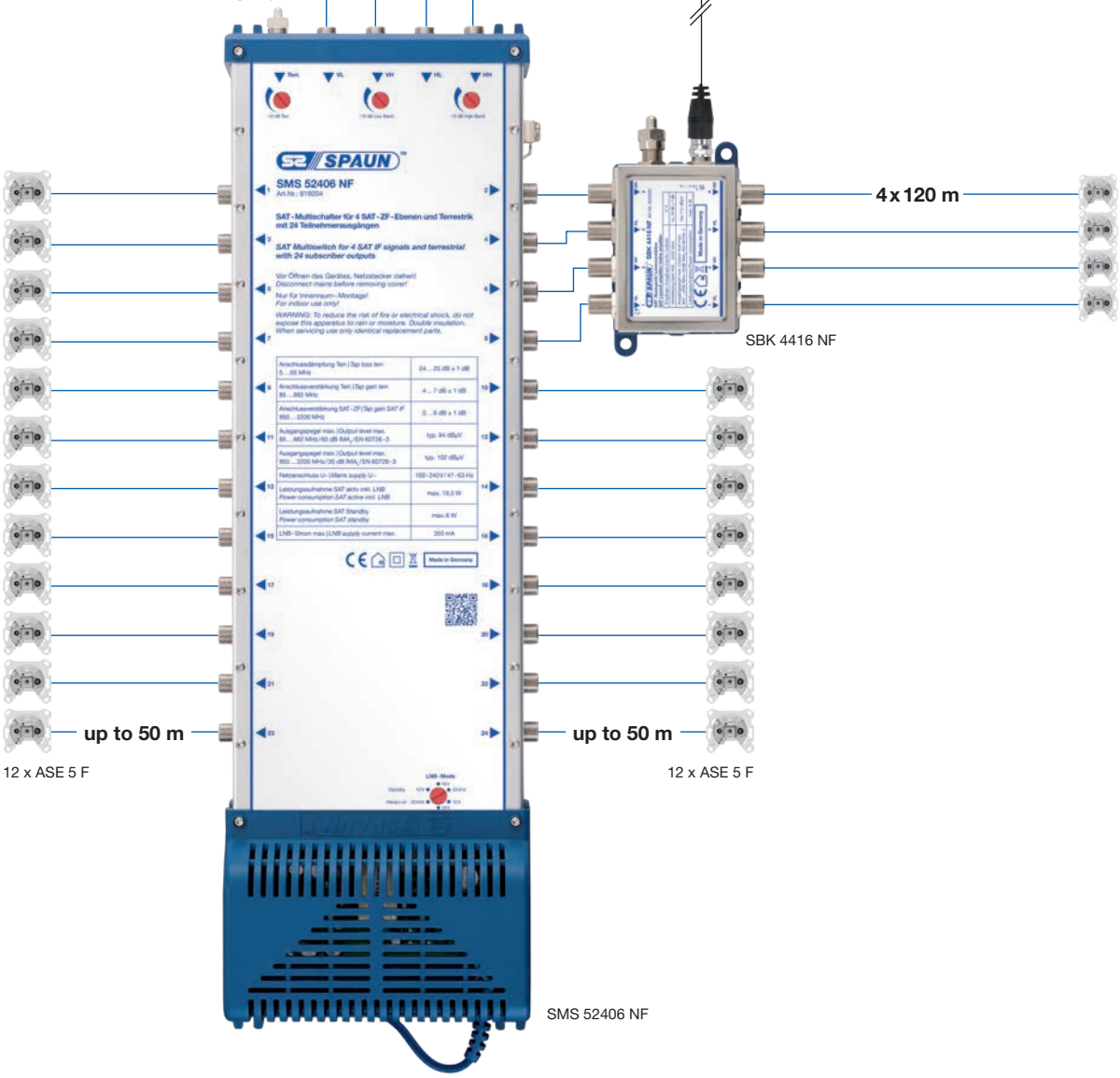
SPAUN recommends according EN 60728-11

EW 4 Art. No.: 852113
EW 5 Art. No.: 852114
EW 6 Art. No.: 852115

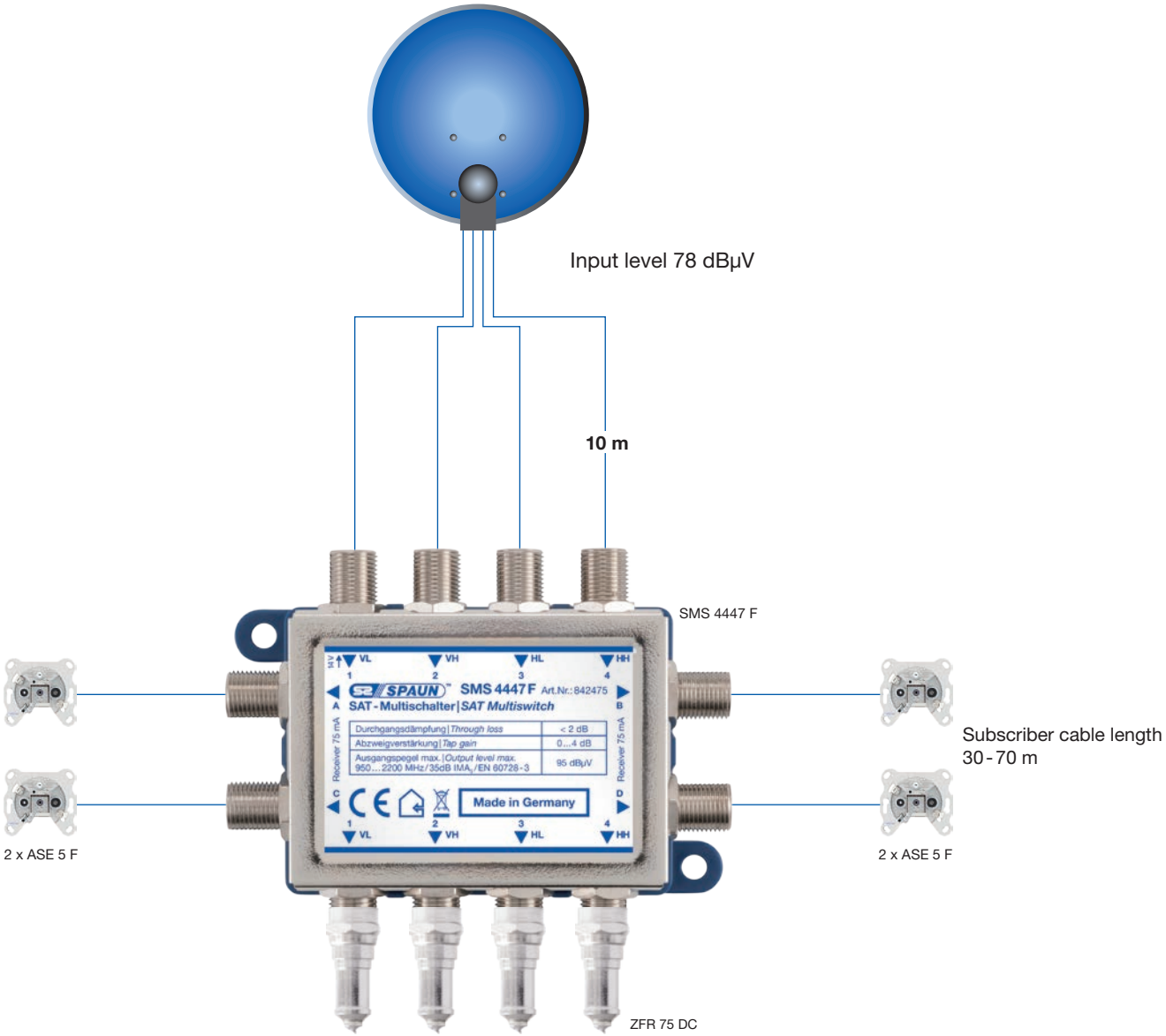
30 m

SNG 18/1000

ZSR 75 F



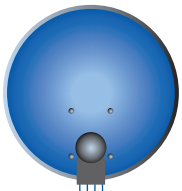
SBK 4416 NF used as 4-way Inline Amplifier.



1 SAT position (4 SAT IF signals) for 4 subscribers.

SPAUN recommends according EN 60728-11

EW 4 Art. No.: 852113
EW 5 Art. No.: 852114
EW 6 Art. No.: 852115



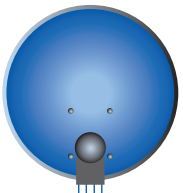
MBW 410 WSG

SBK 5502 NF

1 SAT position (4 SAT IF signals) und terrestrial for 64 subscribers.

All sockets:
ASE 5 F

SPAUN recommends
according EN 60728-11
EW 4 Art. No.: 852113
EW 5 Art. No.: 852114
EW 6 Art. No.: 852115



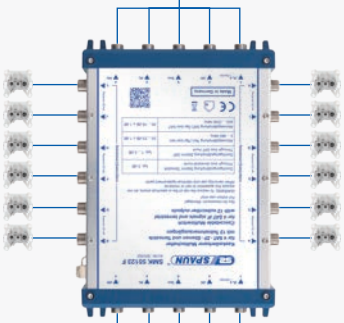
MBW 410 WSG

SBK 5502 NF

ZFR 75 DC

SMK 55163 FA

SMK 55123 F



SMK 55123 F

SMK 55163 FA

House A: 12 subscribers

House B: 12 subscribers

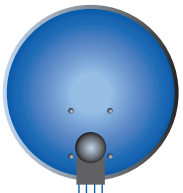
House C: 32 subscribers

1 SAT position (4 SAT IF signals) and terrestrial for 56 subscribers.

Application samples

SPAUN recommends according EN 60728-11

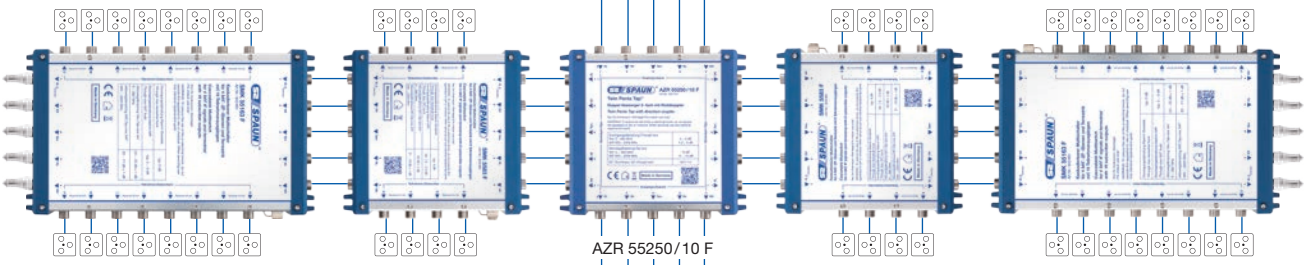
EW 4 Art. No.: 852113
EW 5 Art. No.: 852114
EW 6 Art. No.: 852115



- CATV
- Terrestrial
- Headend

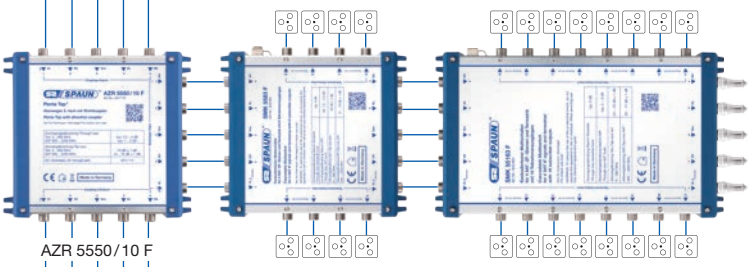
SBK 5503 NFI

SMK 55163 F | SMK 5583 F | SMK 5583 F | SMK 55163 F



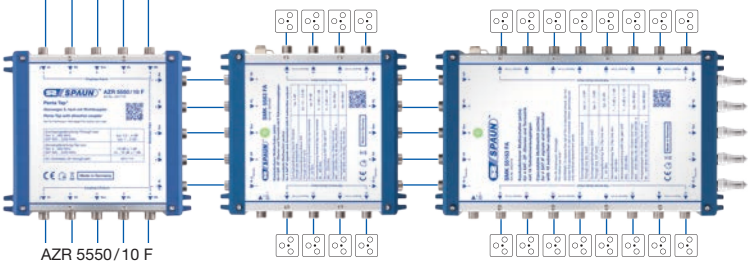
AZR 55250/10 F

SMK 5583 F | SMK 55163 F



AZR 5550/10 F

SMK 5583 FA | SMK 55163 FA



AZR 5550/10 F

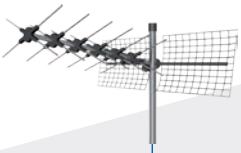
SMK 55243 FA

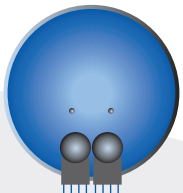
All sockets: ASE 5 F

1 SAT position (4 SAT IF signals) and terrestrial for 120 subscribers.

SPAUN recommends according EN 60728-11

EW 4 Art. No.: 852113
EW 5 Art. No.: 852114
EW 6 Art. No.: 852115





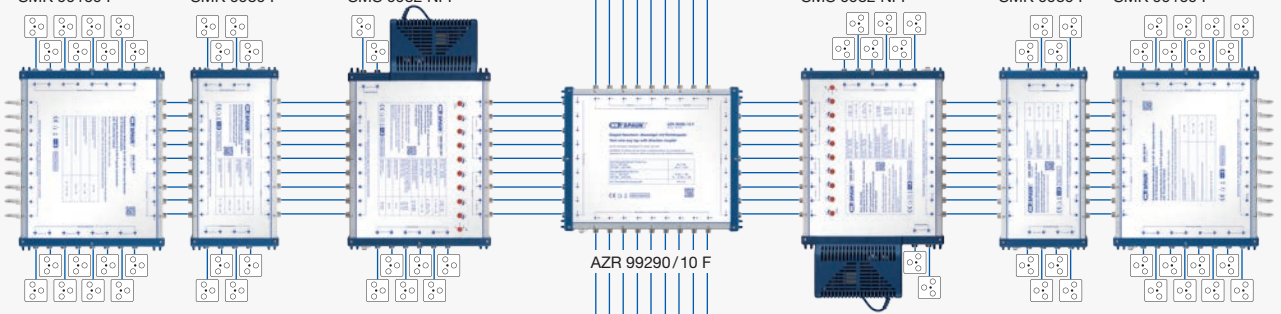
MBW 410 WSG

SBK 9965 NF

SMK 99169 F SMK 9989 F SMK 9989 F SMK 99169 F

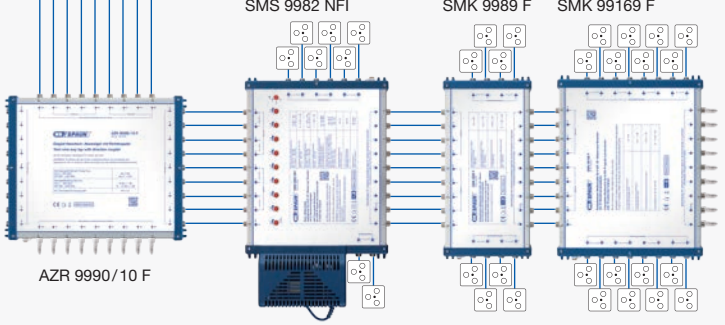
AZR 99290/10 F

SMK 99169 F SMK 9989 F SMS 9982 NFI SMS 9982 NFI SMK 9989 F SMK 99169 F



AZR 99290/10 F

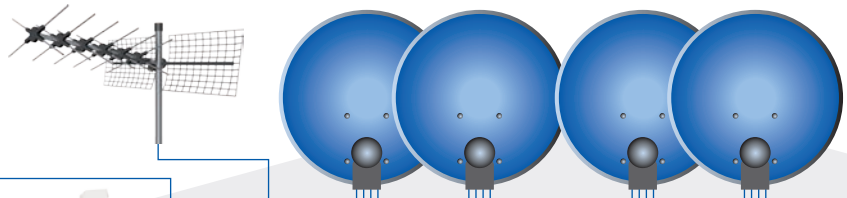
SMS 9982 NFI SMK 9989 F SMK 99169 F



AZR 9990/10 F

All sockets:
ASE 5 F

2 SAT positions (8 SAT IF signals) and terrestrial for 144 subscribers.



MBV 430 NF

VTS 17217

SPAUN recommends according EN 60728-11

EW 4 Art. No.: 852113
EW 5 Art. No.: 852114
EW 6 Art. No.: 852115

All sockets:
ASE 5 F

17

17

SMS 17089 NF

SMK 17169 F

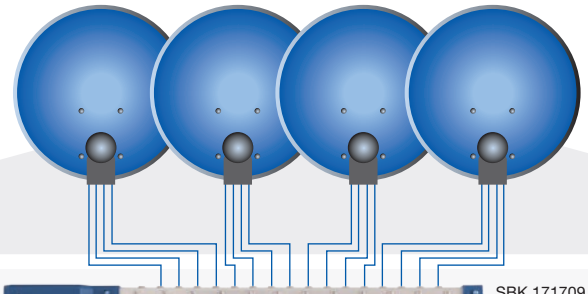
SMK 17089 F

SMK 17169 FA

ZFR 75 DC

ZFR 75 DC

4 SAT positions (16 SAT IF signals) and terrestrial for 96 subscribers.



SPAUN recommends according EN 60728-11

EW 4 Art. No.: 852113
EW 5 Art. No.: 852114
EW 6 Art. No.: 852115

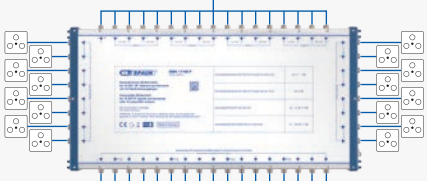
SBK 171709 NF

VTS 17217

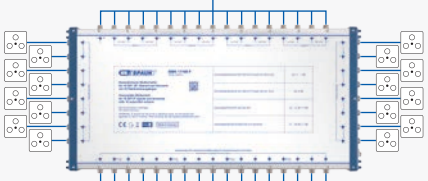
17

All sockets:
ASE 5 F

17



SMK 17169 F



SMK 17169 F

SMS 17089 NF

SMK 17169 F

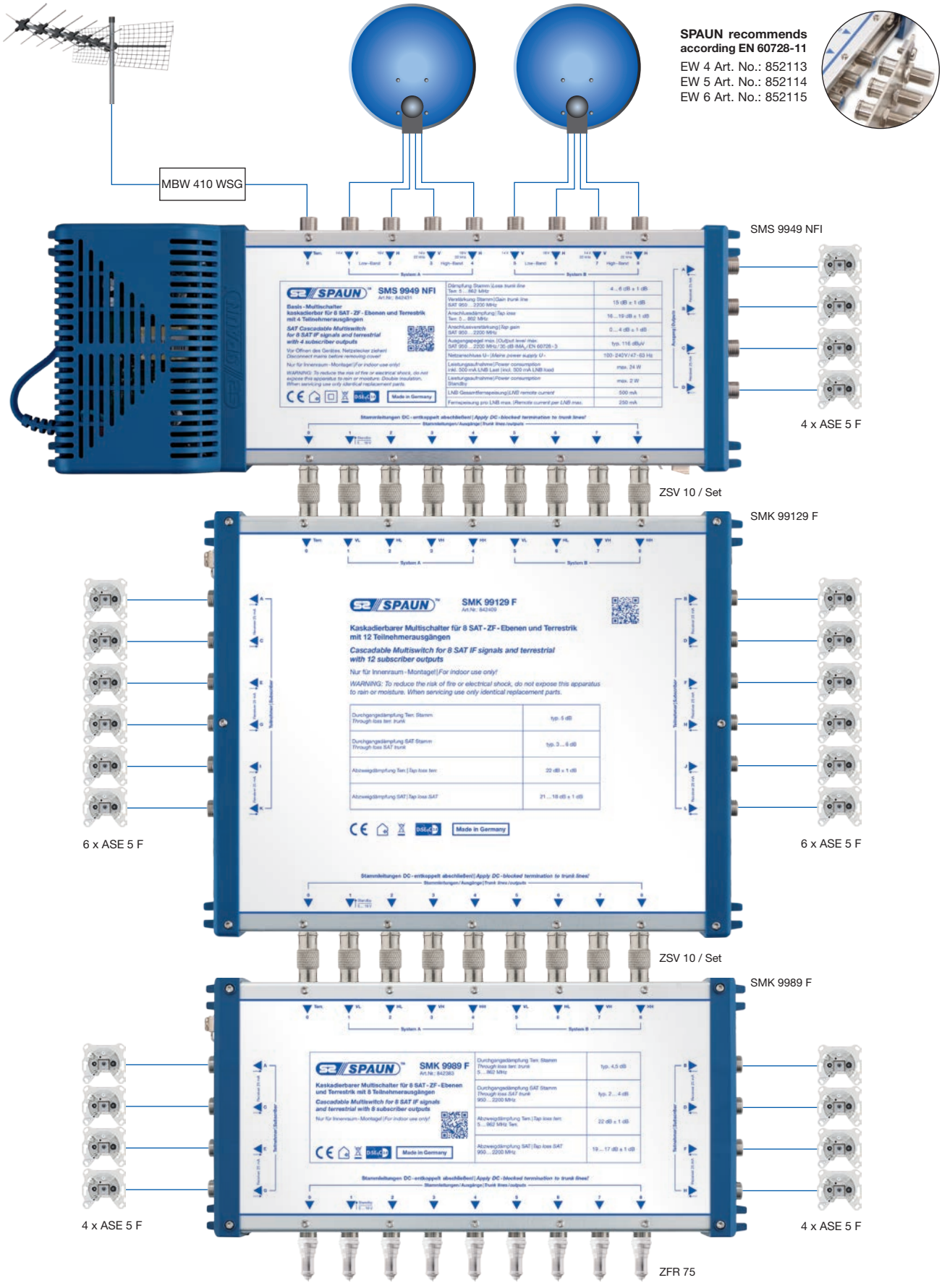
SMK 17169 FA

SMK 17169 FA

ZFR 75 DC

ZFR 75 DC

4 SAT positions (16 SAT IF signals) for 176 subscribers.



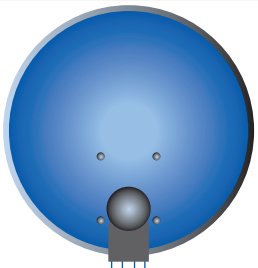
SPAUN recommends according EN 60728-11

EW 4 Art. No.: 852113
EW 5 Art. No.: 852114
EW 6 Art. No.: 852115

2 SAT positions (8 SAT IF signals) and terrestrial for 24 subscribers.

SPAUN recommends according EN 60728-11

EW 4 Art. No.: 852113
EW 5 Art. No.: 852114
EW 6 Art. No.: 852115



FMS 30

SNG 18/1000

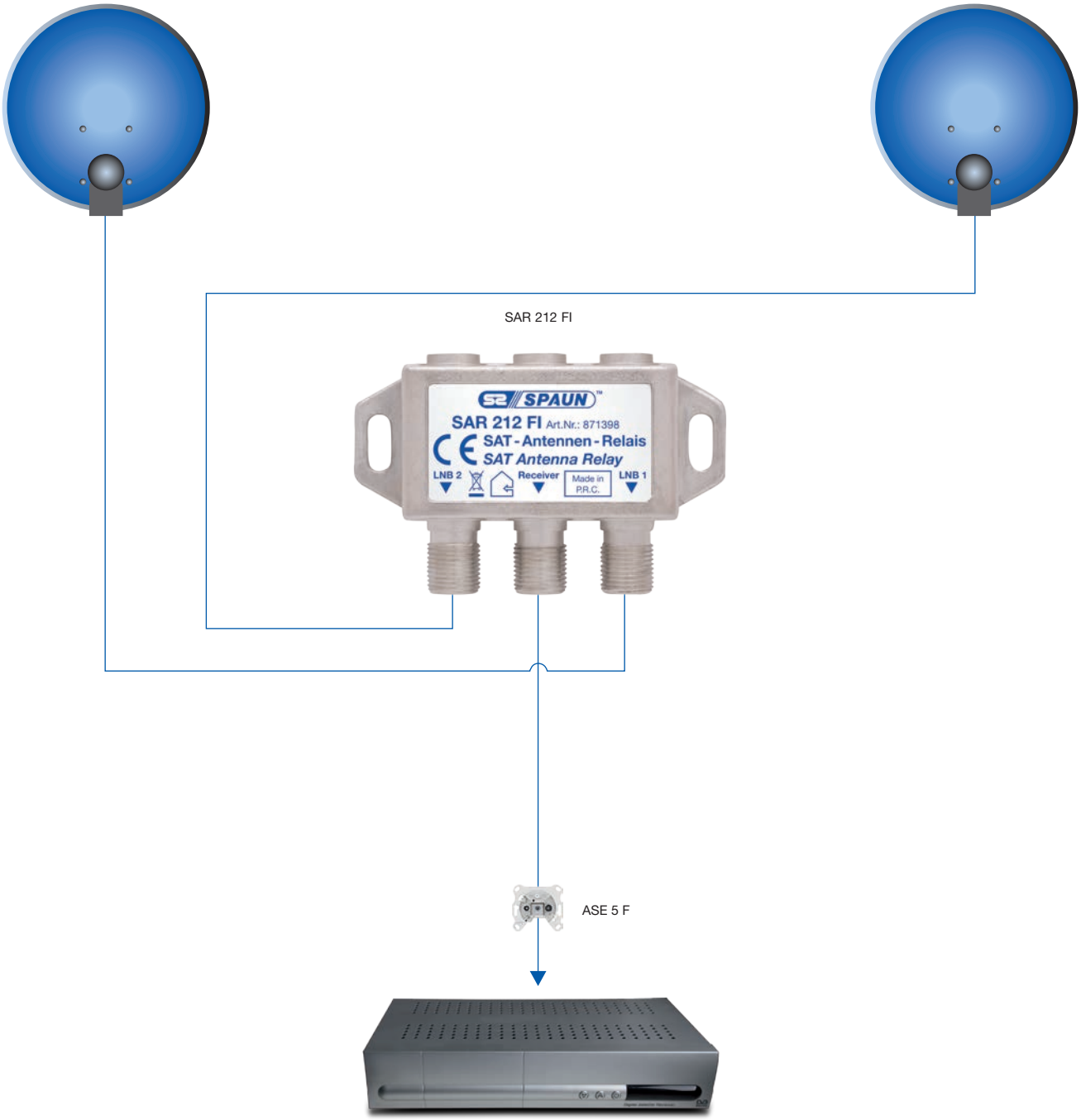
SMK 55243 FA

12 x ASE 5 F

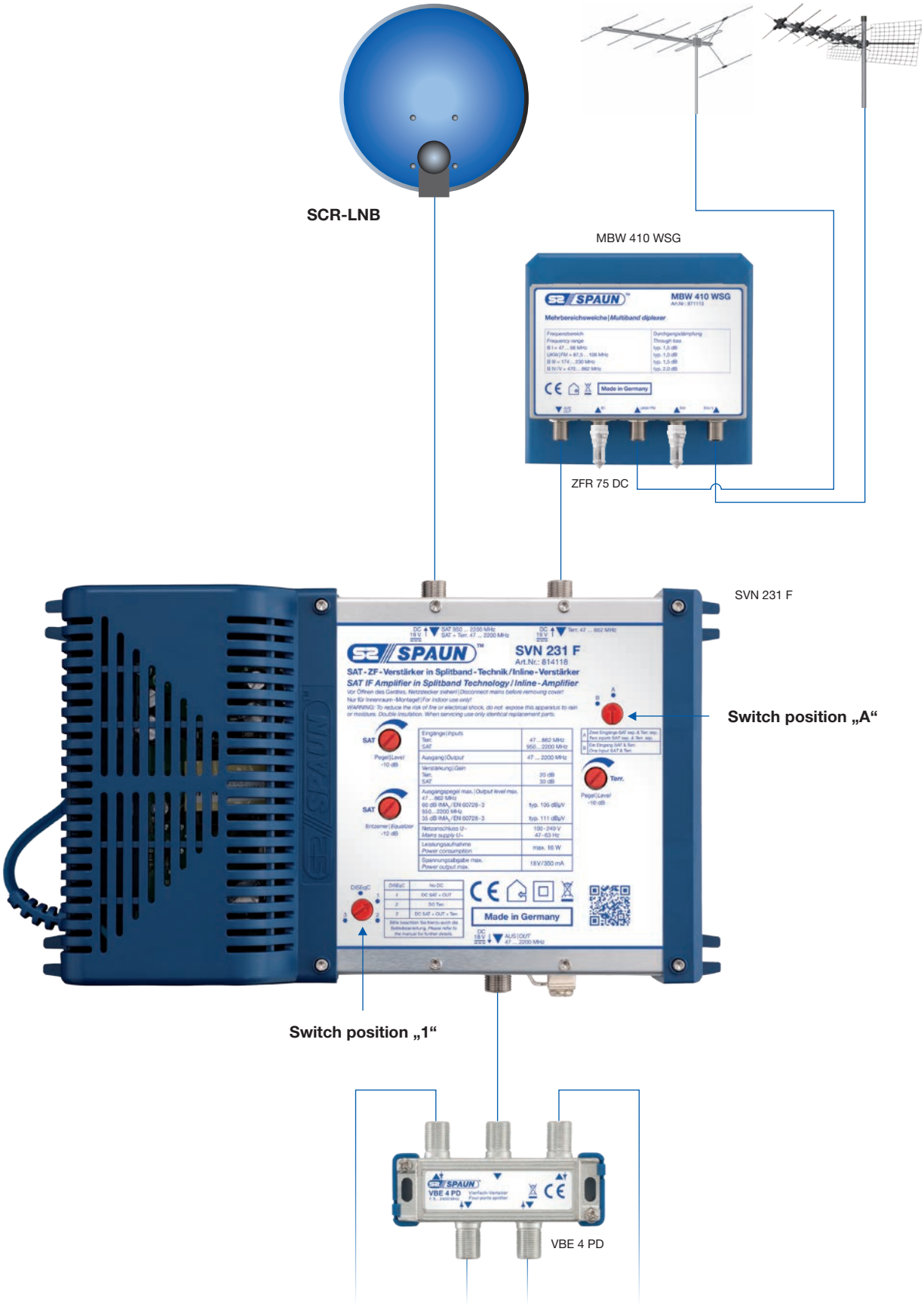
12 x ASE 5 F

ZFR 75 DC

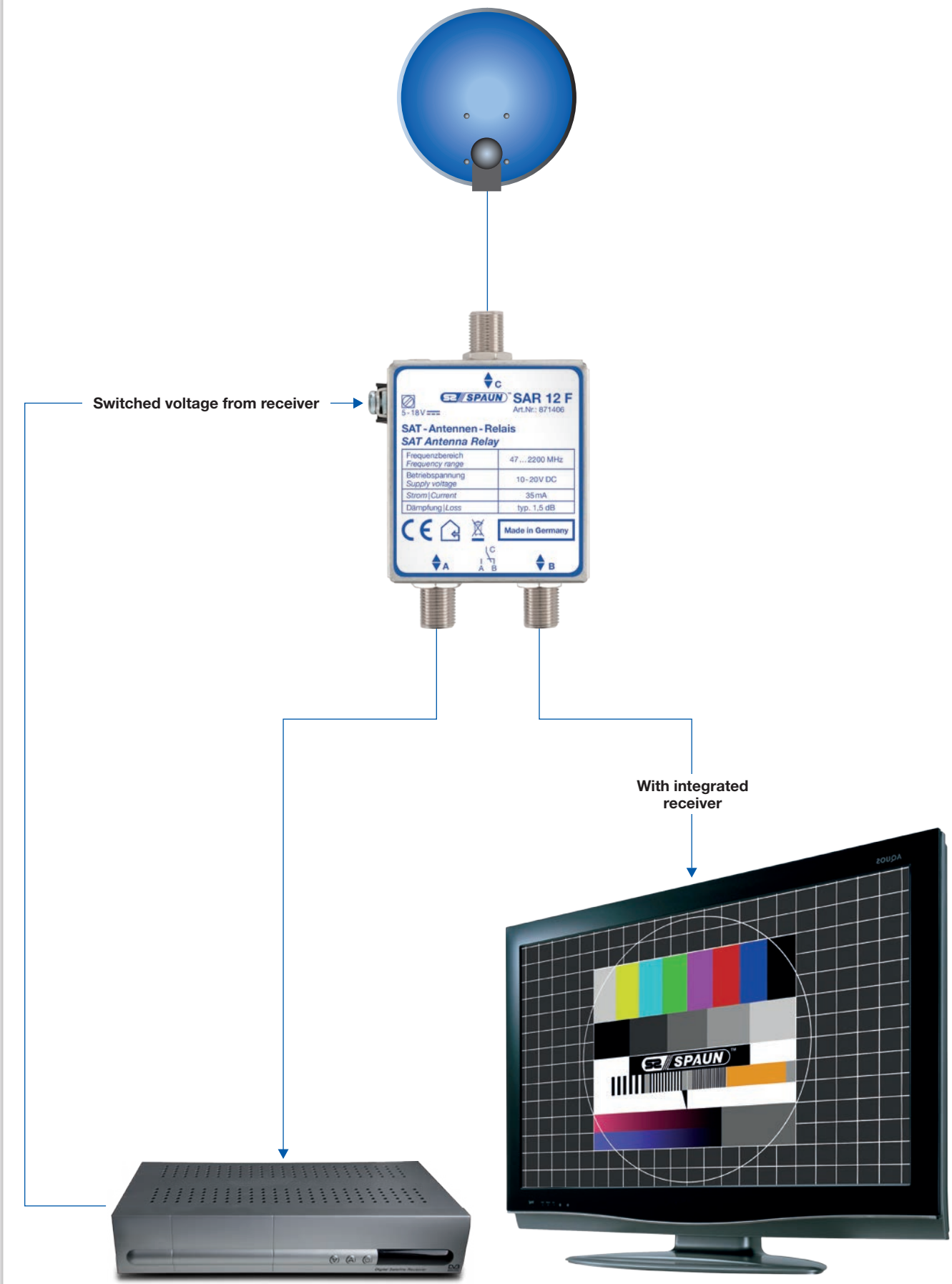
1 SAT position (4 SAT IF signals) and FM for 24 subscribers.



Hookup of 2 single LNBs on one down lead.

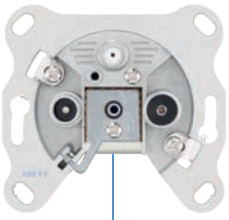


Application sample of an amplification of SAT IF signals and terrestrial.

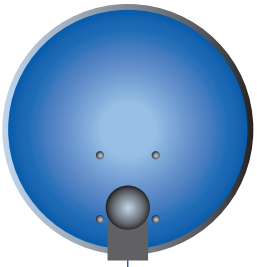


Application sample for SAR 12 F.

MBW 410 WSG



ASE 5 F



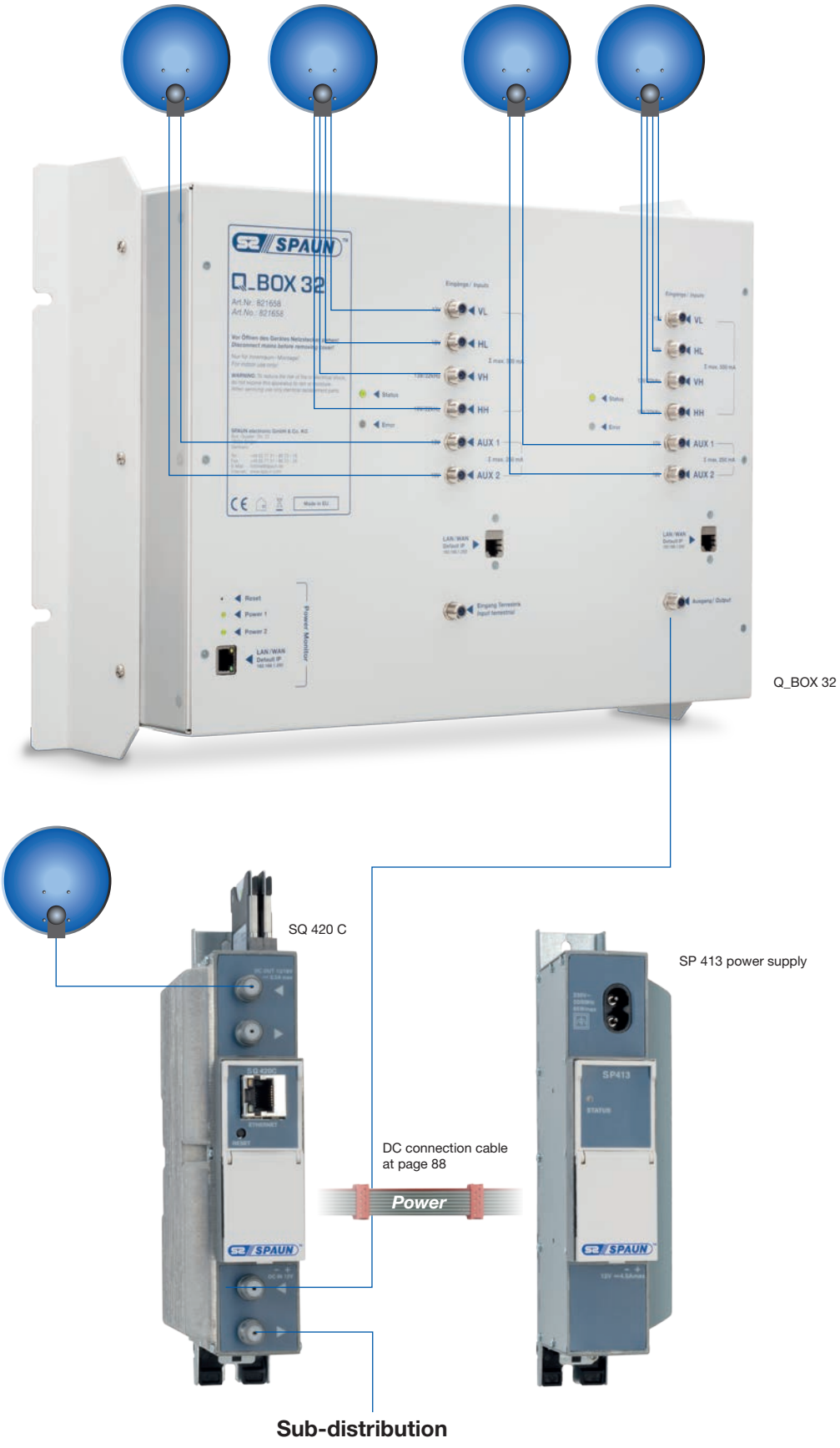
10 m

20 m

10 m

IN / OUT

Hookup of SAT IF signals and terrestrial for 1 subscriber.



Headend with 32 SAT IF transponder (FTA) and 2 SAT IF transponder with encryption into QAM.

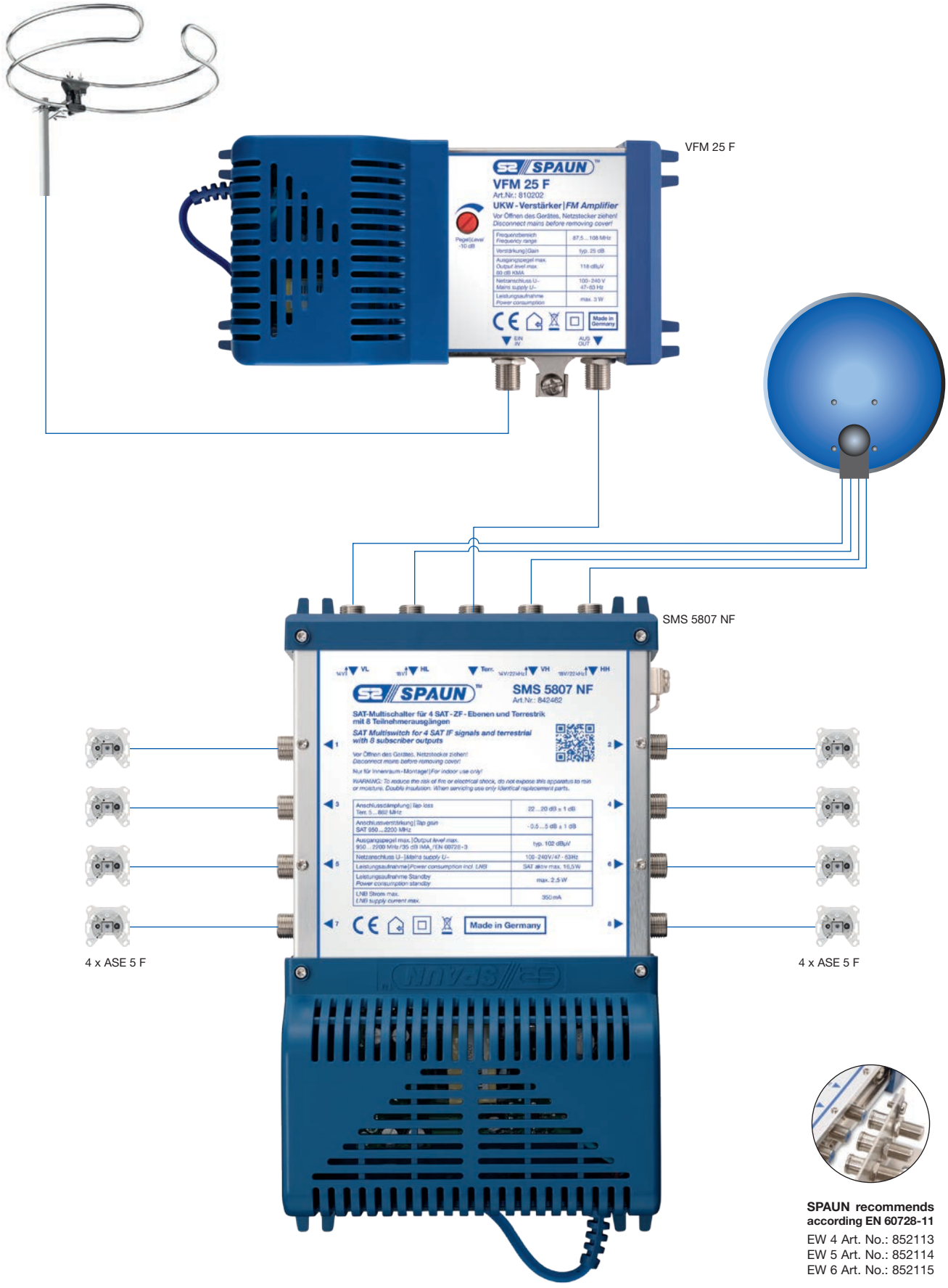
ZFR 75 DC

Sub-distribution

32 QAM channels correspond to ca. 250 TV programs (SD)

Application samples

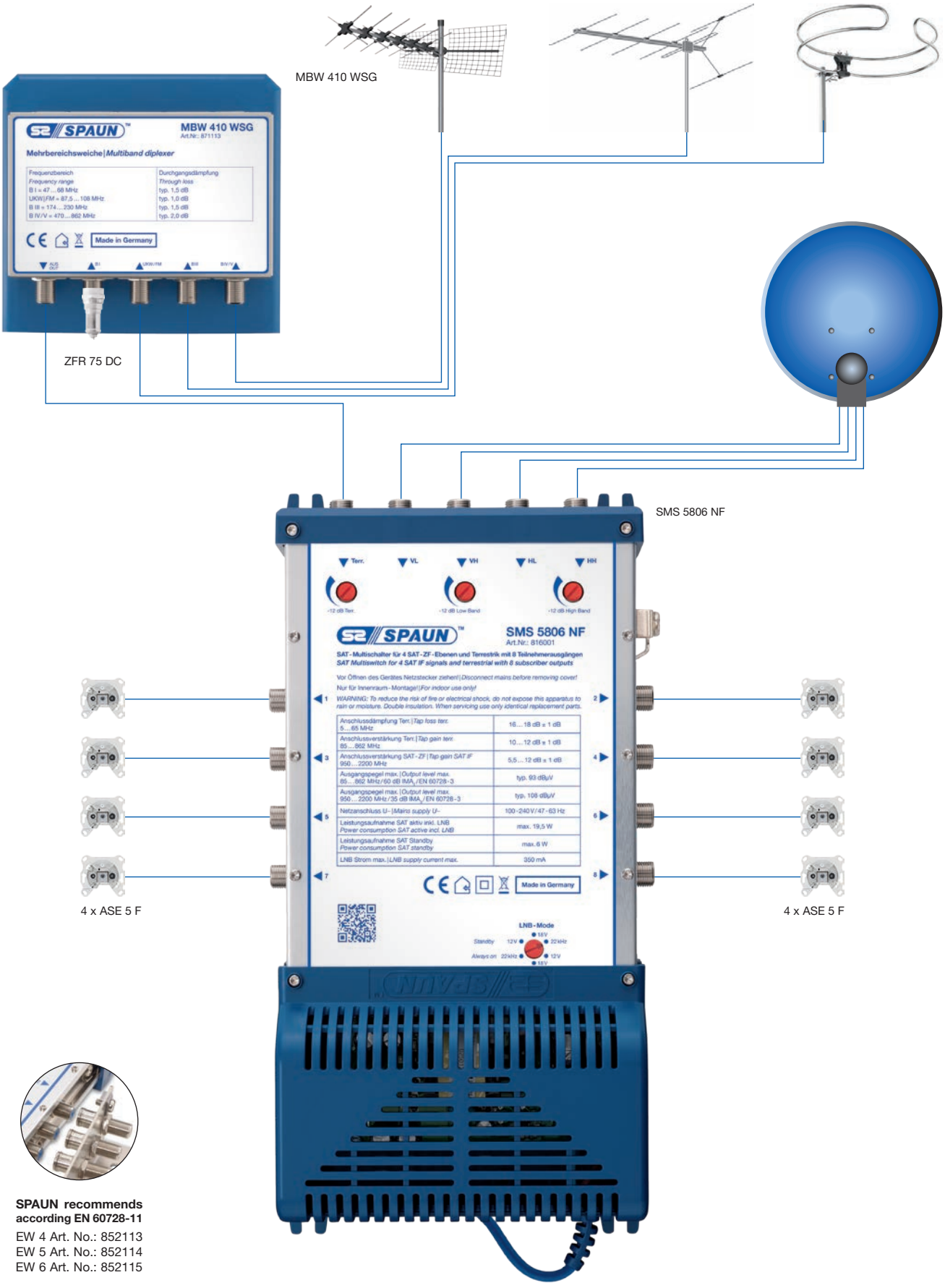
Headend DVB-S/S2 to DVB-C (32 QAM channels).



SPAUN recommends according EN 60728-11

EW 4 Art. No.: 852113
EW 5 Art. No.: 852114
EW 6 Art. No.: 852115

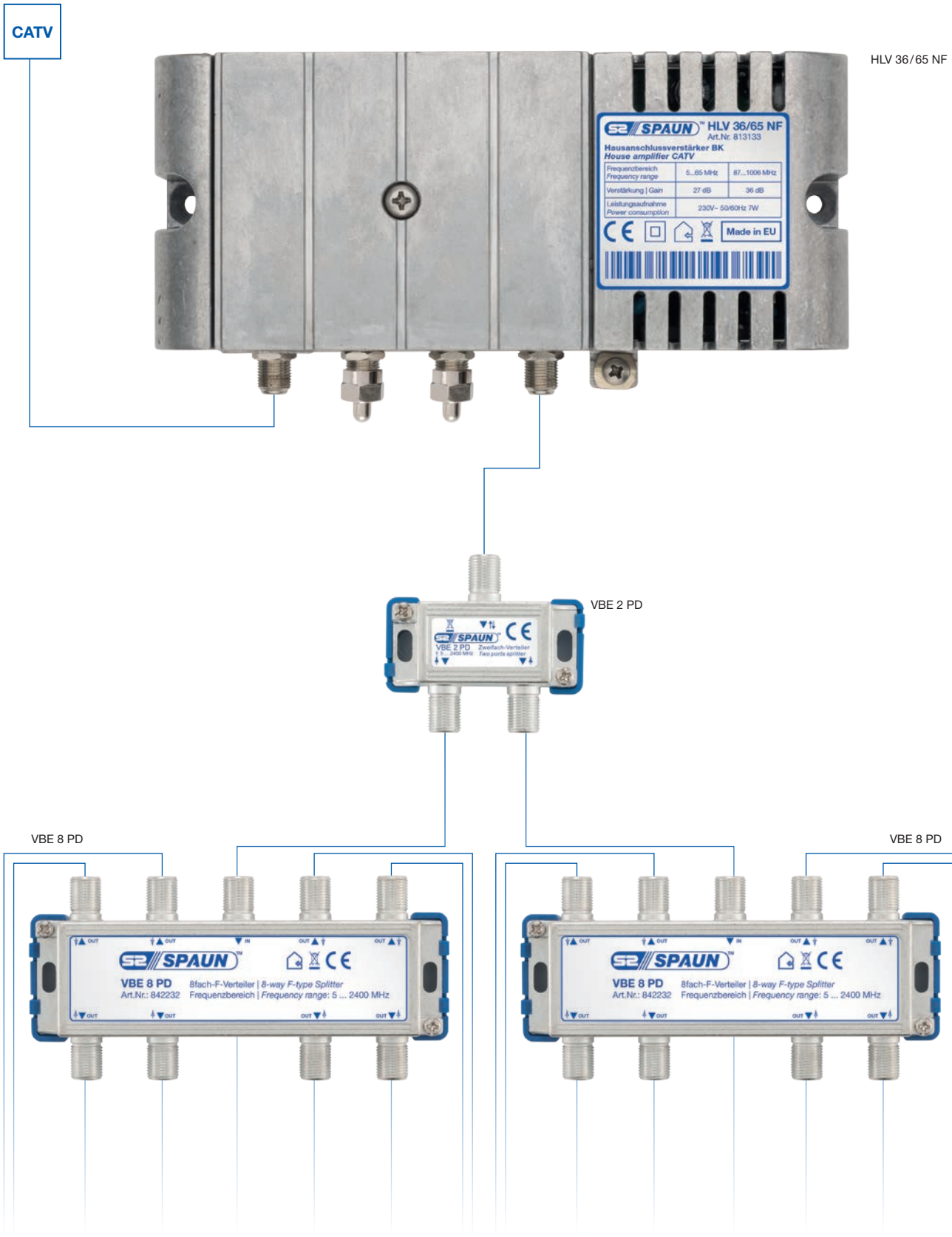
1 SAT position (4 SAT IF signals) and FM for 8 subscribers.



SPAUN recommends according EN 60728-11

EW 4 Art. No.: 852113
EW 5 Art. No.: 852114
EW 6 Art. No.: 852115

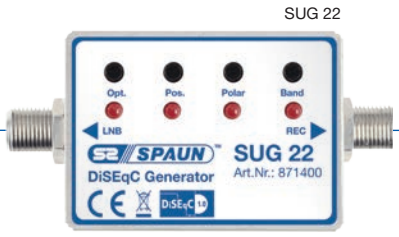
1 SAT position (4 SAT IF signals) and terrestrial for 8 subscribers.



CATV application sample.

SPAUN recommends according EN 60728-11

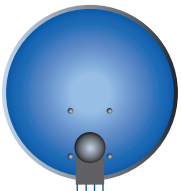
EW 4 Art. No.: 852113
EW 5 Art. No.: 852114
EW 6 Art. No.: 852115



DiSEqC generator application sample.

SPAUN recommends according EN 60728-11

EW 4 Art. No.: 852113
EW 5 Art. No.: 852114
EW 6 Art. No.: 852115



ZFR 75 DC

SBK 5501 NFI

ZFR 75 DC

All sockets: ASE 5 F

VTS 545

SMK 55163 F

SMK 5583 F

ZFR 75 DC

SMK 55123 F

SMK 5583 F

ZFR 75 DC

Application sample of a 5 wire 4 - way splitter.